INFORMATION SERVICES INDUSTRY

1981 ANNUAL PRESENTATION

ABOUT INPUT

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed in 1974, INPUT has become a leading international consulting firm. Clients include over 100 of the world's largest and most technically advanced companies.

M-1981

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AUTHOR
CPI
Presentation

Information Services Industry
Program   Annual Client Presentat
1981

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INPUT
Planning Services for Management

INFORMATION SERVICES INDUSTRY PROGRAM

ANNUAL CLIENT PRESENTATION
1981

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I. INTRODUCTION

INPUT SERVICES

SUBSCRIPTION PROGRAMS

MULTI-CLIENT RESEARCH

MANAGEMENT TOOLS

CUSTOM RESEARCH

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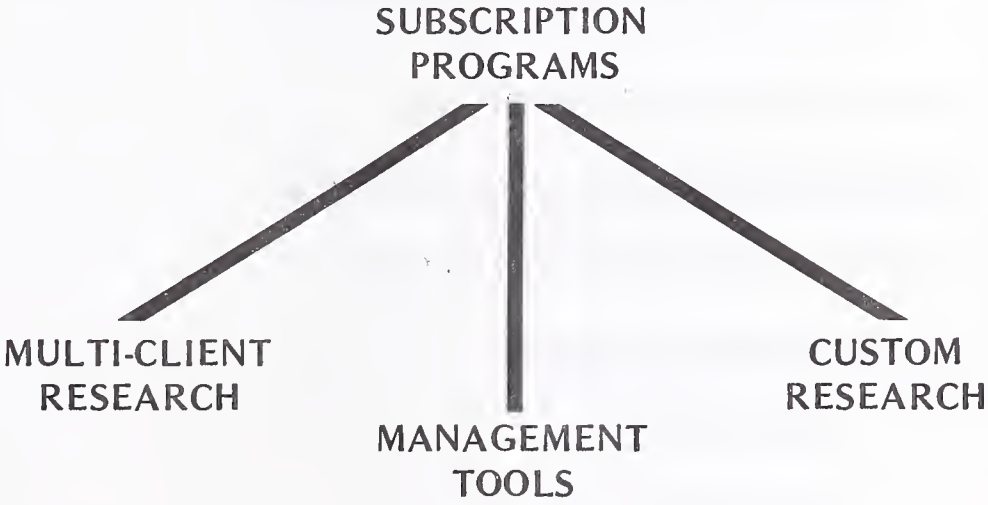
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1981 ACHIEVEMENTS

- REVENUE INCREASE OF 40%

- IMPROVED PROFIT PERFORMANCE

- STREAMLINED ORGANIZATION

- STRENGTHENED STAFF

    — MANAGEMENT

    — PROFESSIONAL

- IMPROVED PRODUCT DELIVERY PERFORMANCE

- FIRST ACQUISITION

INPUT

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PROGRAMS

YEAR	NUMBER OF CLIENTS	
1976	36	INFORMATION SERVICES INDUSTRY
1976	40	COMPANY ANALYSIS AND MONITORING
1978	60	INFORMATION SYSTEMS PLANNING
1980	40	FIELD SERVICE- U.S./EUROPE
1981	4	ON-TARGET MARKETING

INFORMATION SYSTEMS PROGRAM

- PLANNING FOR COMPUTER/COMMUNICATIONS BUYERS

- VENDOR WATCH REPORTS

- RESIDUAL VALUES

- MANAGEMENT ISSUES

- TECHNOLOGY IMPACTS

- EXTENSIONS

  - OFFICE COMMUNICATIONS

  - SOFTWARE DEVELOPMENT

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- 4 -

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FIELD SERVICE PROGRAM

- SOFTWARE AND HARDWARE MAINTENANCE

- BUSINESS/MANAGEMENT ISSUES

- NEW METHODS AND PROCESSES

- PERSONNEL FACTORS

- CUSTOMER/MARKETING/PRICING

- CUSTOMER CONSIDERATIONS

- EXTENSION - CUSTOMER SATISFACTION SURVEY

INPUT

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COMPANY ANALYSIS AND MONITORING PROGRAM

- DESCRIPTIONS/DIRECTORY/INQUIRY SERVICE

- INFORMATION SERVICES COMPANIES:

    - PROCESSING

    - SOFTWARE

    - PROFESSIONAL SERVICES

    - TURNKEY SYSTEMS

- 2500 SUMMARY/400 DETAIL DESCRIPTIONS

- COMPETITIVE/PRODUCT ANALYSIS

- ACQUISITION ACTIVITY

- 6 -

MCP1P9

ON-TARGET MARKETING

- MARKETING METHODOLOGY — "HOW TO DO IT."

- PRACTICAL TOOLS FOR:

    - MARKET SEGMENTATION

    - COMPETITIVE ANALYSIS

    - COMPANY "POSITIONING"

    - INTELLIGENCE GATHERING

- PROCEDURES, GUIDELINES, FORMS, EXAMPLES

- WORKSHOPS/CONSULTING

INPUT

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INPUT

MULTI-CLIENT STUDIES

- IMPROVING SOFTWARE DEVELOPMENT PRODUCTIVITY

- INTERNATIONAL ON-LINE DATA BASE SERVICES

- CAD/CAM SYSTEM AND SERVICE APPLICATIONS AND MARKETS

- COMPUTER OUTPUT SERVICES MARKETS
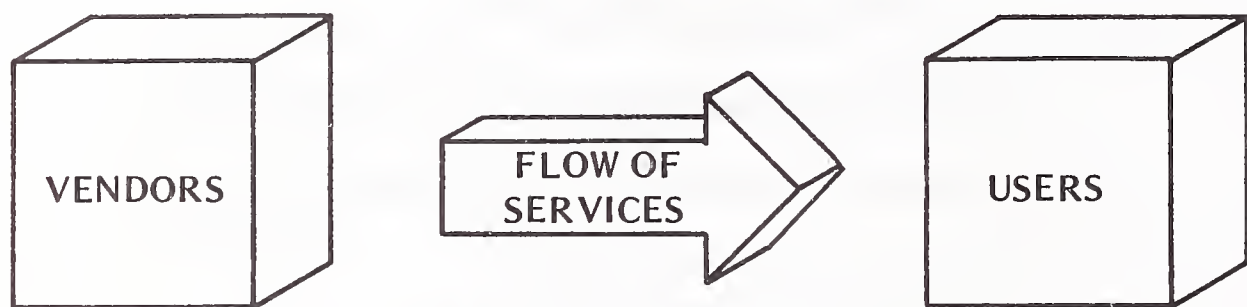
- PERSONAL COMPUTERS IN LARGE ORGANIZATIONS

MCP1P11

RECENT CUSTOM PROJECTS

- BUSINESS PLAN DEVELOPMENT

- PROFESSIONAL SERVICES BUYING PATTERNS

- RCS COMPANY EXPENSE DISTRIBUTION

- OFFICE COMMUNICATIONS

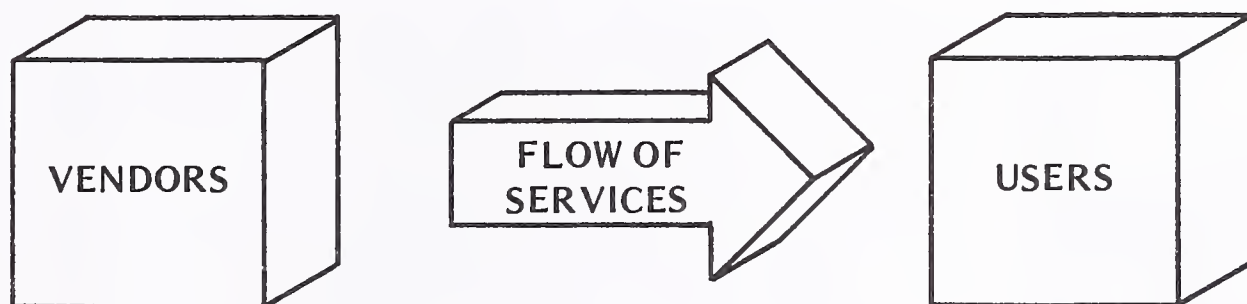- DOMESTIC NETWORK SERVICES

- CANADIAN COMPUTER SERVICES MARKET

TRANSITION

VENDORS → FLOW OF SERVICES → USERS

- TYPES OF SERVICE

- MODES OF DELIVERY

- NEW COMPETITION
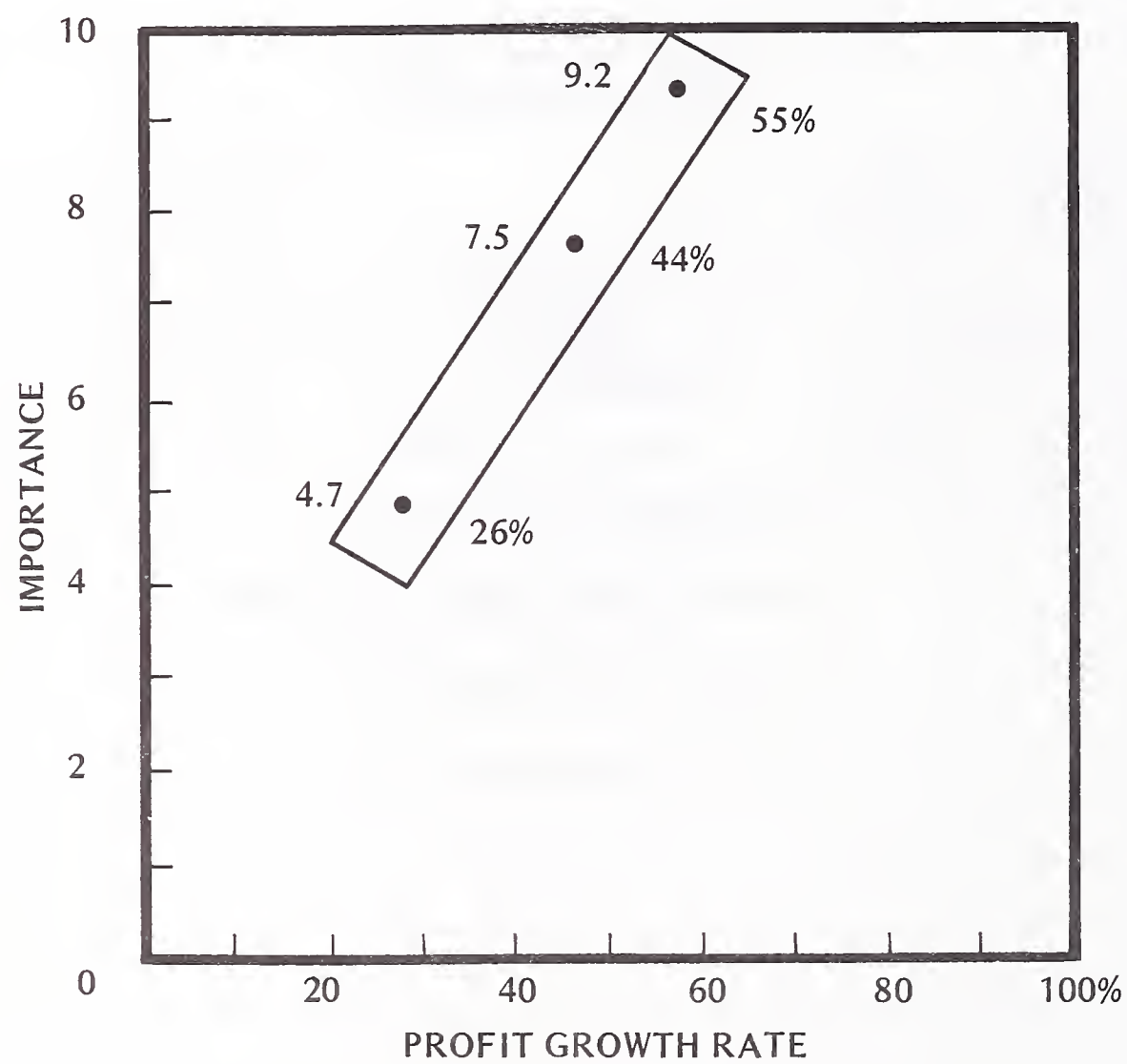
MCP1P1

CHALLENGES

VENDORS → FLOW OF SERVICES → USERS

- CHANGING TECHNOLOGY

- VIABLE MARKETING PROGRAMS

- SCARCITY OF RESOURCES

- INCREASING COMPETITION

MCP1PI4

INPUT

IMPORTANCE OF CORPORATE PLANNING

PROFIT GROWTH RATE

(Y-axis: IMPORTANCE, values 0, 2, 4, 6, 8, 10)

Data points:
- 9.2, 55%
- 7.5, 44%
- 4.7, 26%

- 12 -
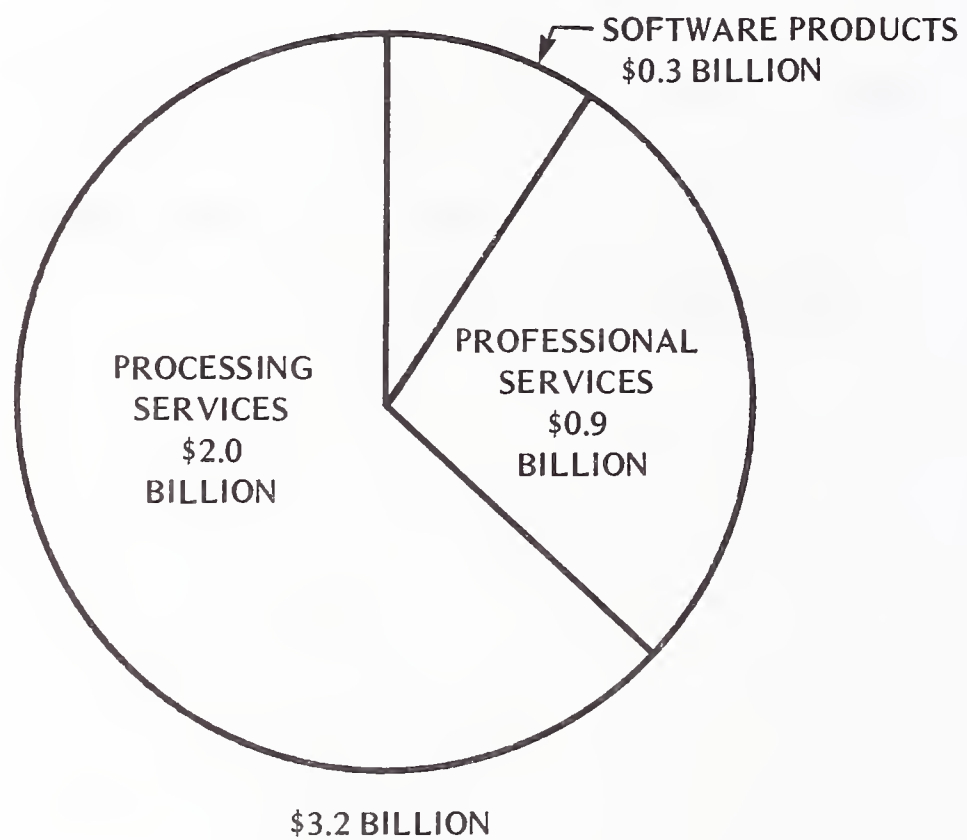
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II. EXECUTIVE SUMMARY

INFORMATION SERVICES INDUSTRY

- GROWING AND CHANGING DRAMATICALLY

INPUT

MCP1P17

INPUT

U.S. COMPUTER SERVICES MARKET - 1970
(CURRENT DOLLARS)

SOFTWARE PRODUCTS
$0.3 BILLION

PROCESSING
SERVICES
$2.0
BILLION

PROFESSIONAL
SERVICES
$0.9
BILLION

$3.2 BILLION

MCP1P18

INPUT

INPUT

U.S. INFORMATION SERVICES MARKET - 1980
(CURRENT DOLLARS)

SOFTWARE
PRODUCTS
$2.7 BILLION

PROCESSING
SERVICES
$8.3 BILLION

PROFESSIONAL
SERVICES
$3.8 BILLION

$14.8 BILLION

INPUT

- 15 -

MCP1P19
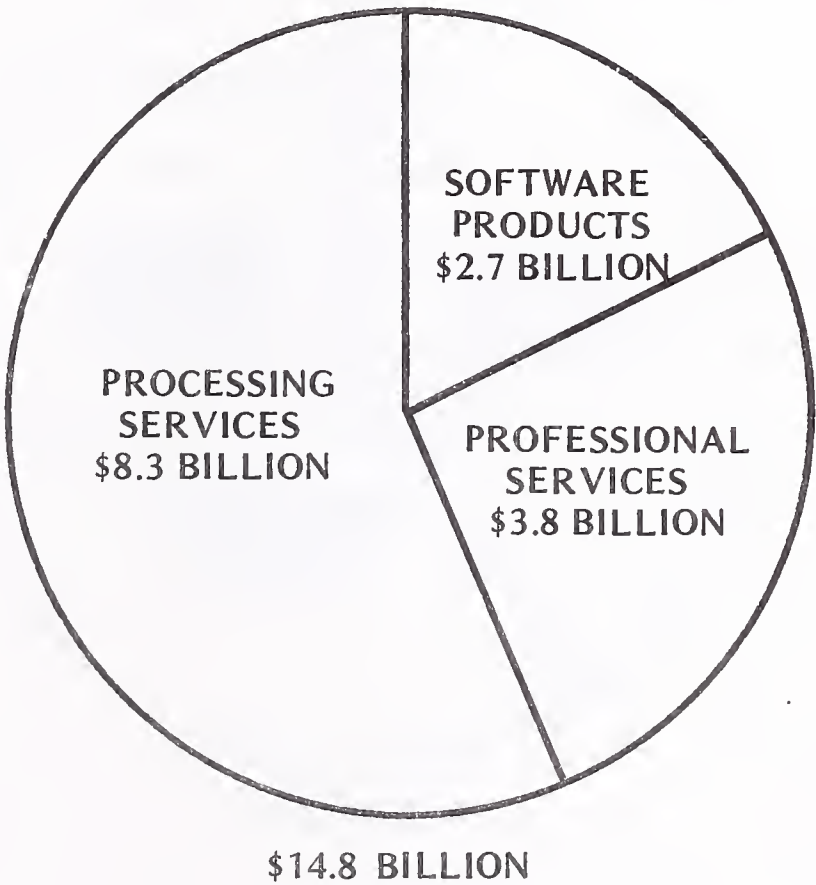
INPUT

U.S. INFORMATION SERVICES MARKET - 1986
(CURRENT DOLLARS)

PROCESSING
SERVICES
$21 BILLION

SOFTWARE
PRODUCTS
$15 BILLION

PROFESSIONAL
SERVICES
$17 BILLION

$53 BILLION

- 16 -

MCP1P20
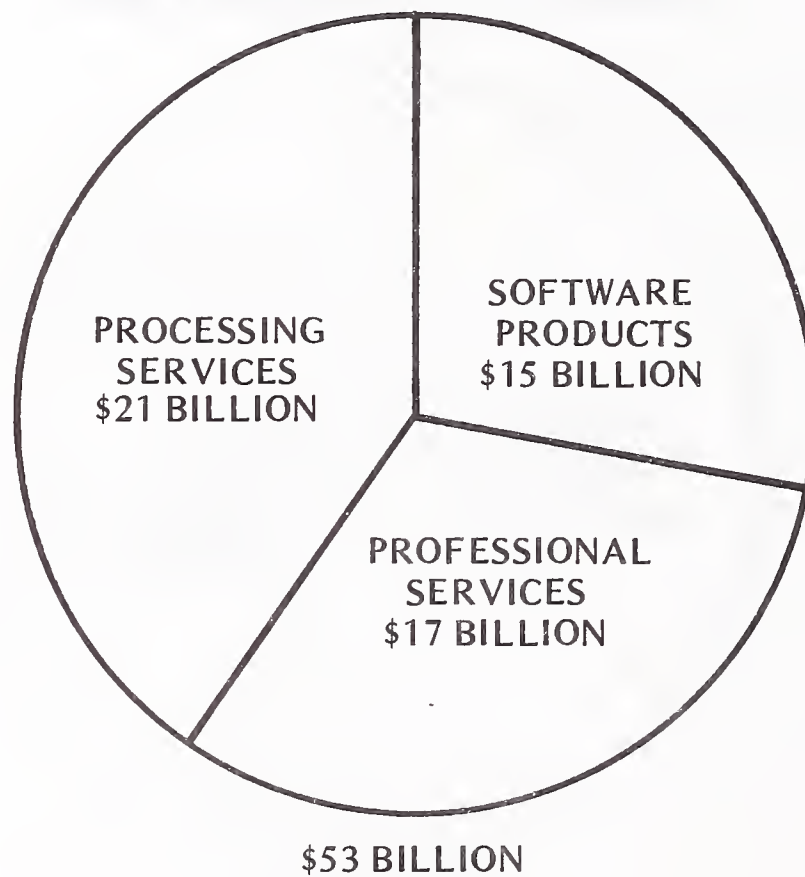
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OPPORTUNITIES

- BUSINESS GRAPHICS

- USER SITE HARDWARE SERVICES

- ENERGY RELATED MARKETS

- PROFESSIONAL SERVICES

- PERSONAL SYSTEMS

- 17 -

MCP1P21

FURTHER OPPORTUNITIES

- APPLICATION - SPECIFIC TURNKEY SYSTEMS/ SERVICES

- NETWORK SERVICES

- SYSTEMS IMPLEMENTATION/FACILITIES MANAGEMENT

- DATA BASES AND ASSOCIATED APPLICATIONS

- SOFTWARE "MANUFACTURING"/"PUBLISHING"

MCP1P22

INPUT

OVERALL ISSUES

- ECONOMY

- CHANGING BUYER ENVIRONMENT

- SOFTWARE DEVELOPMENT

   ⟶ APPLICATIONS IMPLEMENTATION PROCESS

- OFFICE/TELECOMMUNICATIONS TARGETS

- CONTINUING HARDWARE CHANGES

- FUTURE LIMITS OF SERVICE

INPUT

MCP1P23

INPUT

1982 PROCESSING SERVICES ISSUES

- SHORTAGE OF PEOPLE

- IN-HOUSE ALTERNATIVES

- RE-INVESTMENT IN SYSTEMS AND NETWORKS

    — HARDWARE

    — SOFTWARE

- MIGRATION TO NEW AREAS

- NEW COMPETITION

INPUT

MCP1P24

INPUT

1982 SOFTWARE ISSUES

- NEW ENTRIES

- "HIT PARADE" SYNDROME

- INTEGRATION OF GRAPHICS

- DISTRIBUTED PROCESSING

- CHANGING SOFTWARE ECONOMICS

- PEOPLE LIMITATIONS

- INTEGRATION OF HARDWARE

INPUT

- 21 -

MCP1P25

INPUT

INPUT

MCP1P26

III. STATE OF THE INDUSTRY

- PERFORMANCE OF LEADING FIRMS
- ACQUISITION ACTIVITY

PERFORMANCE OF LEADING FIRMS
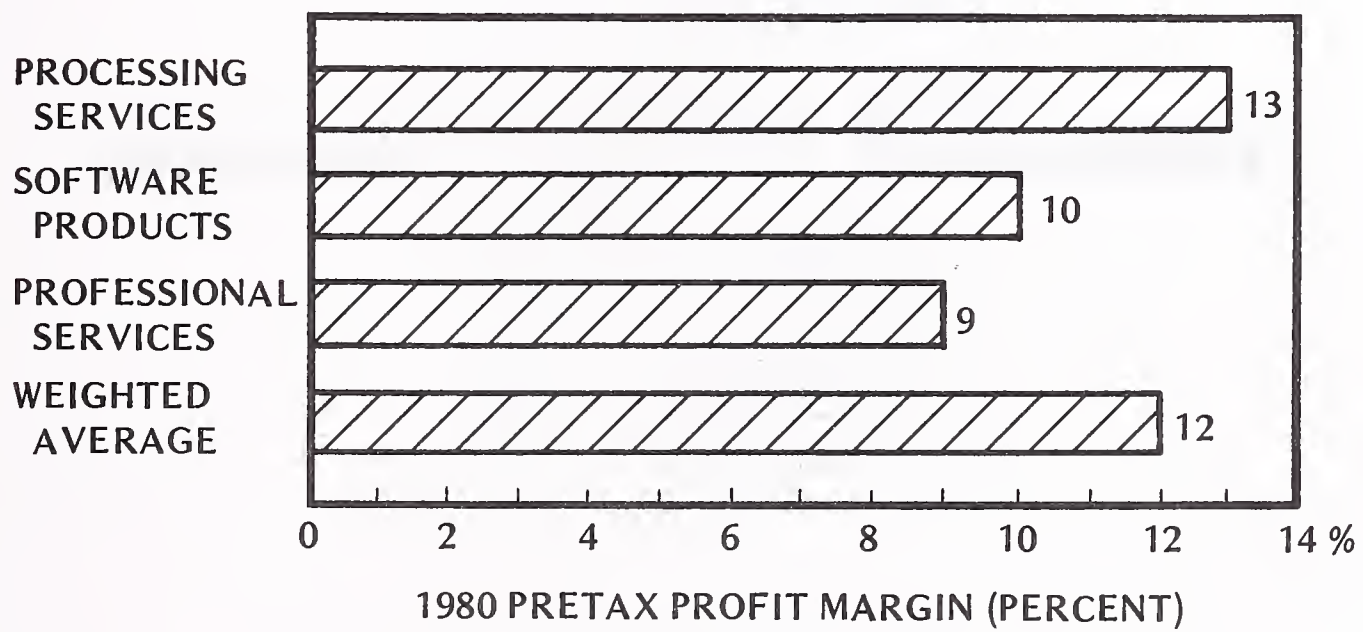
PERFORMANCE OF PUBLIC COMPANIES

- PROFITS
  - $376 MILLION
  - 28% GROWTH

- PROFIT MARGIN
  - 11.6% 1979
  - 11.6% 1980

1980 PUBLIC COMPANY PERFORMANCE

Bar chart titled "1980 PUBLIC COMPANY PERFORMANCE" showing 1980 pretax profit margin (percent):
- PROCESSING SERVICES: 13
- SOFTWARE PRODUCTS: 10
- PROFESSIONAL SERVICES: 9
- WEIGHTED AVERAGE: 12

X-axis: 1980 PRETAX PROFIT MARGIN (PERCENT), scale 0 to 14 %

- 25 -

MCP1P29

INPUT

PERFORMANCE OF PUBLIC COMPANIES

- 56 COMPANIES ANALYZED

- REVENUES
  - $3.2 BILLION
  - 27% GROWTH

MCP1P30

INPUT

PUBLIC COMPANY
PBT - FISCAL 1980

QUOTRON	25%
SMS	25
ADP	17
MDSI	17

INPUT

MCP1P31

INPUT

PUBLIC COMPANY
PBT - FISCAL 1980

NATIONAL DATA	15%
TYMSHARE	15
ANACOMP	12
EDS	12
CSC	10

INPUT

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PRODUCTIVITY 1979, 1980

Bar chart titled "PRODUCTIVITY 1979, 1980" showing REVENUE PER EMPLOYEE ($ THOUSANDS):

- PROCESSING SERVICES: 1979 = 42, 1980 = 46
- SOFTWARE PRODUCTS: 1979 = 65, 1980 = 66
- PROFESSIONAL SERVICES: 1979 = 33, 1980 = 39
- OVERALL: 1979 = 42, 1980 = 47

X-axis: 0 5 10 15 20 25 30 35 40 45 50 55 60 65 $70

REVENUE PER EMPLOYEE
($ THOUSANDS)

Legend: 1979 (hatched), 1980 (white)

- 29 -

MCP1P33
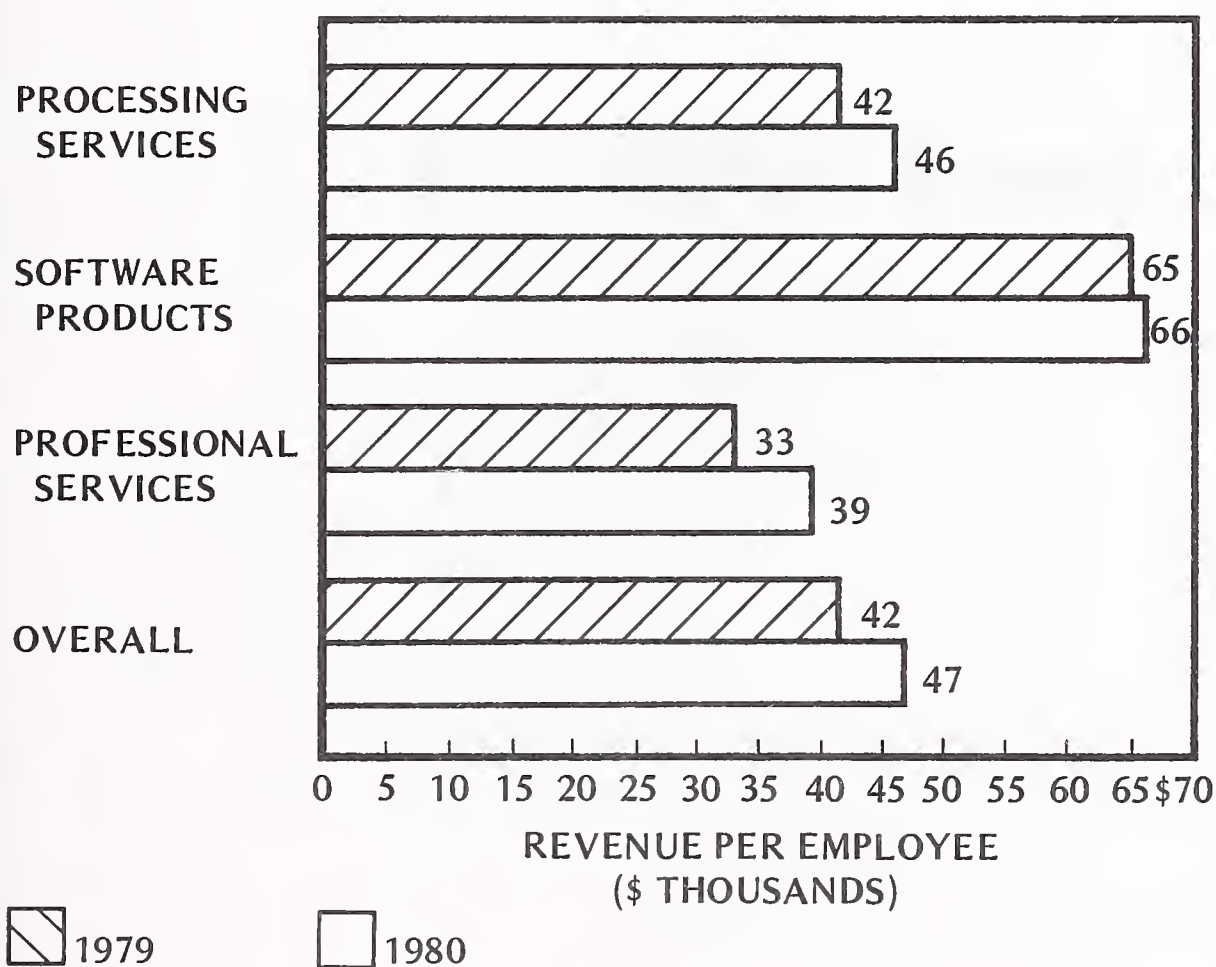
INPUT

VENDOR PERFORMANCE

- U.S. REVENUES

- NON-CAPTIVE

- CALENDAR 1980

MCP1P3

INPUT

INPU

LARGEST INFORMATION SERVICES VENDORS

	1980 REVENUES ($ MILLIONS)	GROWTH RATE (PERCENT)
IBM	730	39%
CDC	560	17
CSC	465	27
ADP	435	25
EDS	388	28

1980 REVENUES
($ MILLIONS)

- 31 -
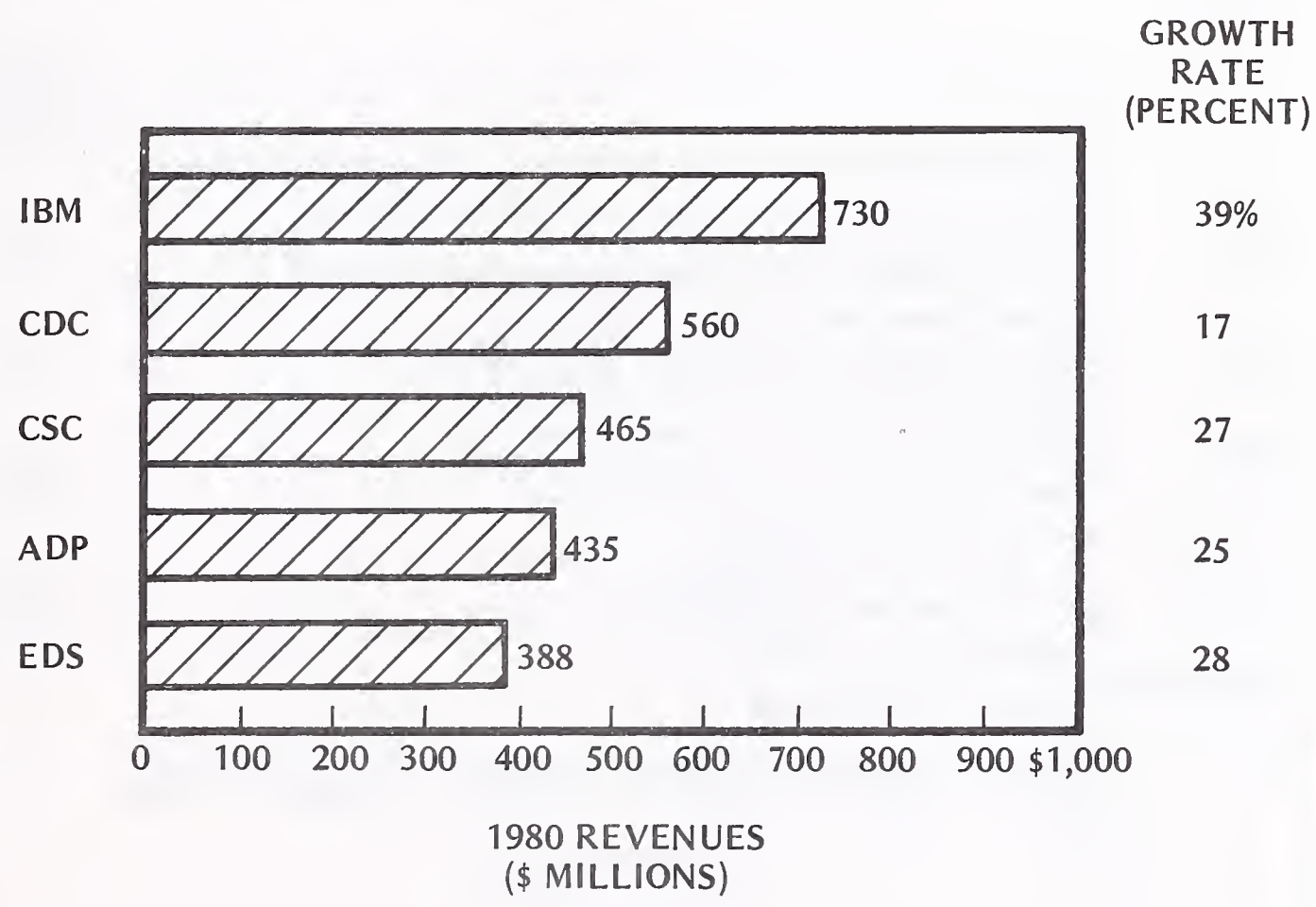
LARGEST PROCESSING SERVICES
VENDORS

	REVENUES 1980 ($ MILLIONS)	GROWTH RATE (PERCENT)
ADP	420	24%
CDC	310	16
EDS	293	28
GEISCO	193	16
TYMSHARE	166	10

REVENUES 1980
($ MILLIONS)

- 32 -
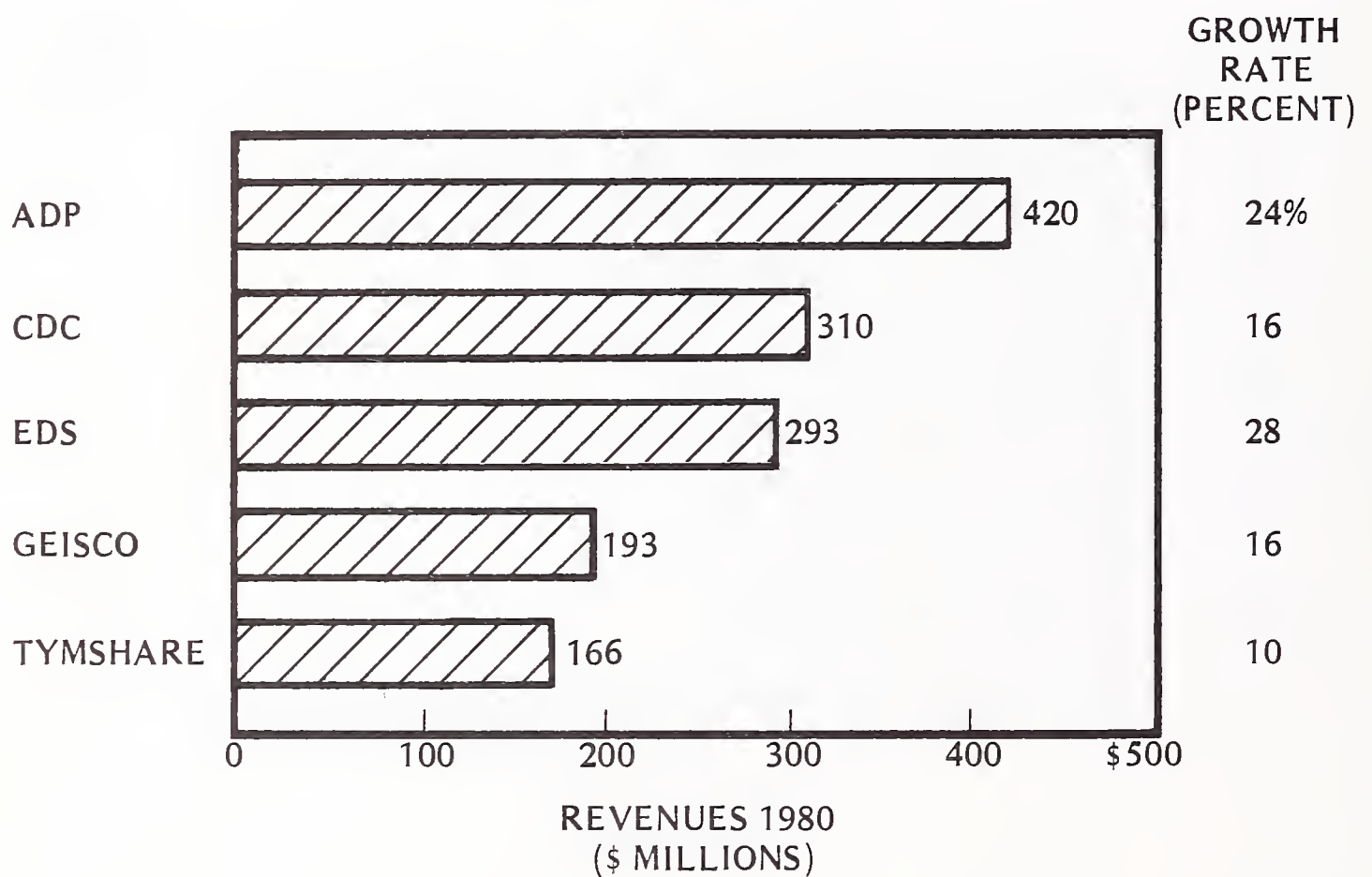
FASTEST GROWING VENDORS
- PROCESSING SERVICES OVER $25 MILLION

	1980 REVENUES ($ MILLIONS)	GROWTH RATE (PERCENT)
CITICORP	45	309%
SUN INFORMATION	25	123
ANACOMP	54	77
CABLE DATA	26	65
TEXAS INSTRUMENTS	69	57
NLT	26	50

1980 REVENUES
($ MILLIONS)

INPUT

- 33 -

MCP1P37
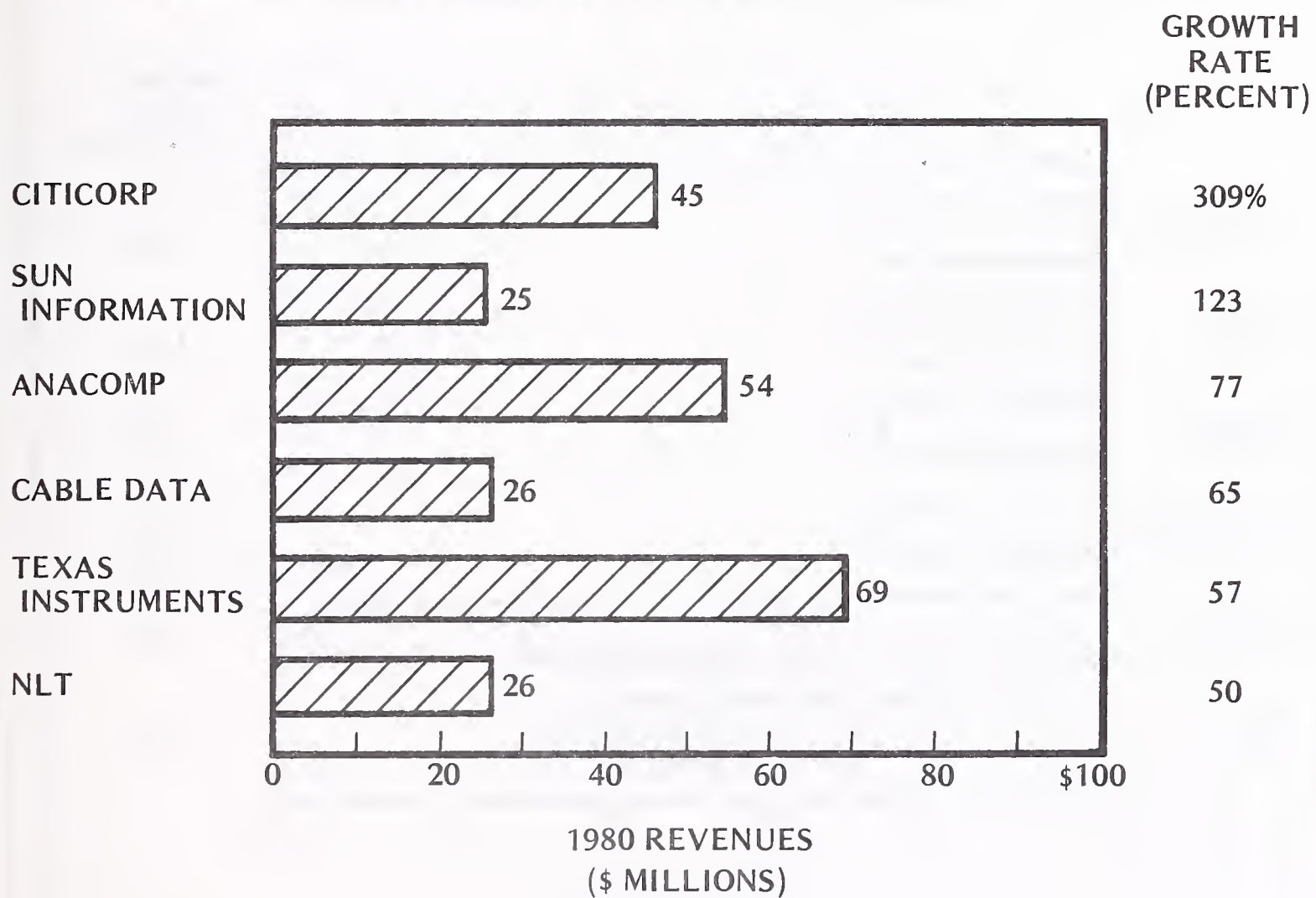
INPUT

FASTEST GROWING COMPANIES
– RCS OVER $25 MILLION

GROWTH
RATE
(PERCENT)

Company	1980 Revenues	Growth Rate
CITICORP	25	123%
SUN	25	123
MMDS	26	47
DYATRON	26	36
CHASE	93	34
BCS	59	33

0   20   40   60   80 $100

1980 REVENUES
($ MILLIONS)

INPUT

MCP1P38
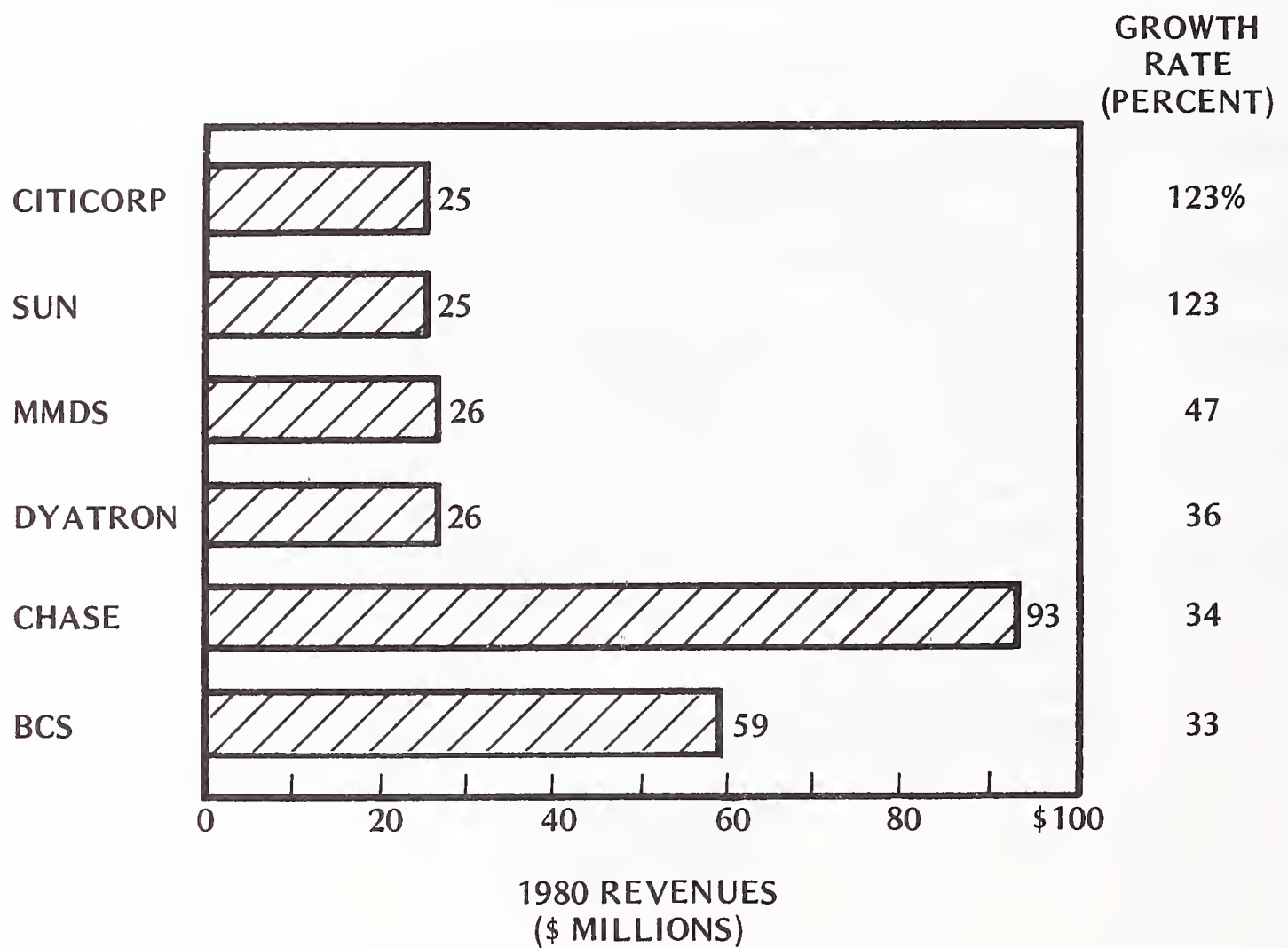
INPUT

LARGEST FM VENDORS

	1980 REVENUES ($ MILLIONS)	GROWTH RATE (PERCENT)
EDS	253	27%
SIA	86	21
SMS	72	29
MCAUTO	57	17
BRADFORD	39	15
SYSTEMATICS	31	22

1980 REVENUES
($ MILLIONS)

INPUT

MCP1P39
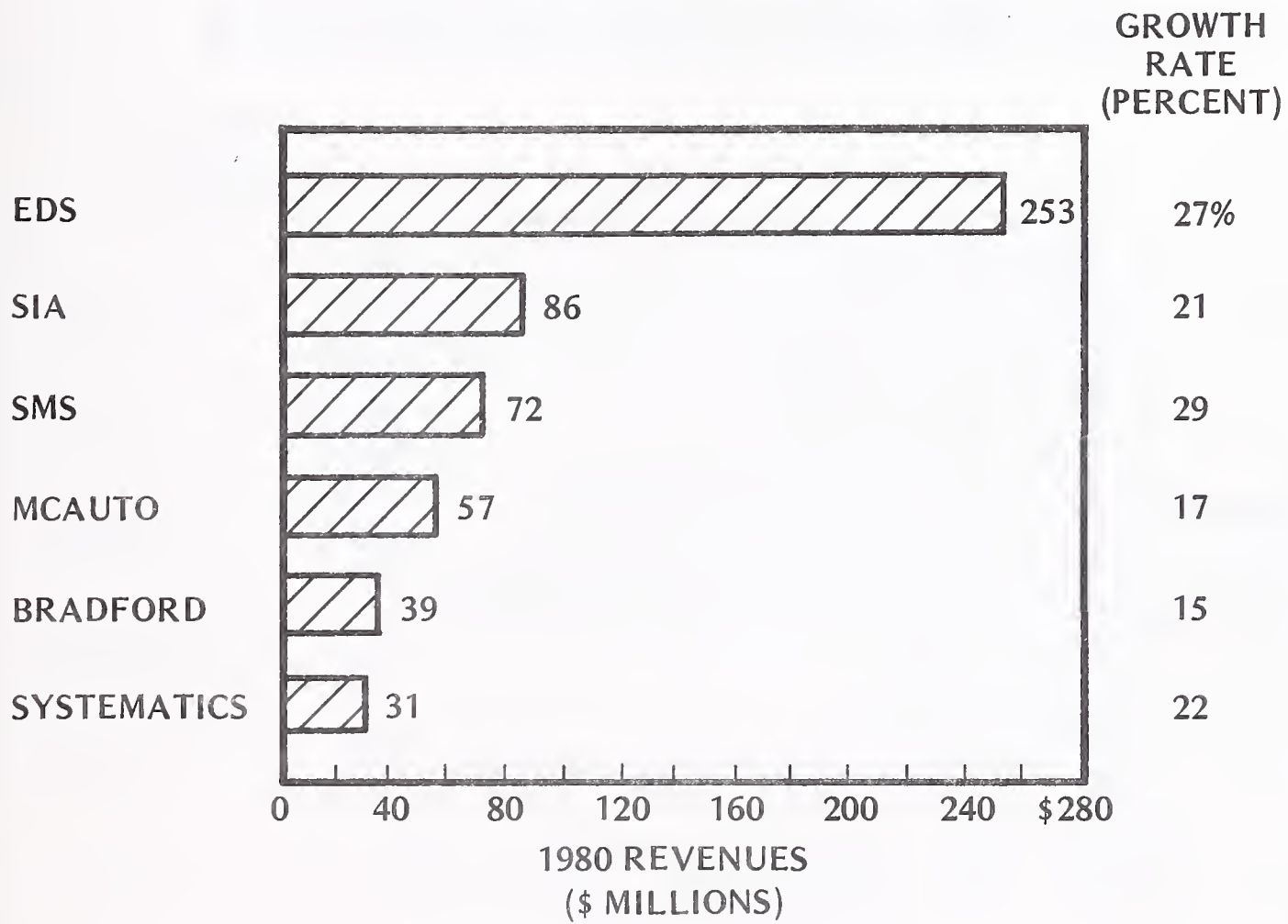
INPUT

FASTEST GROWING COMPANIES
- BATCH SERVICES OVER $25 MILLION

GROWTH
RATE
(PERCENT)

Company	1980 Revenues ($ Millions)	Growth Rate (Percent)
ANACOMP	36	135%
CSC	40	122
TEXAS INSTRUMENTS	69	57
WESTERN GEOPHYSICAL	82	39
DIGICON	27	39

1980 REVENUES
($ MILLIONS)

MCP1P
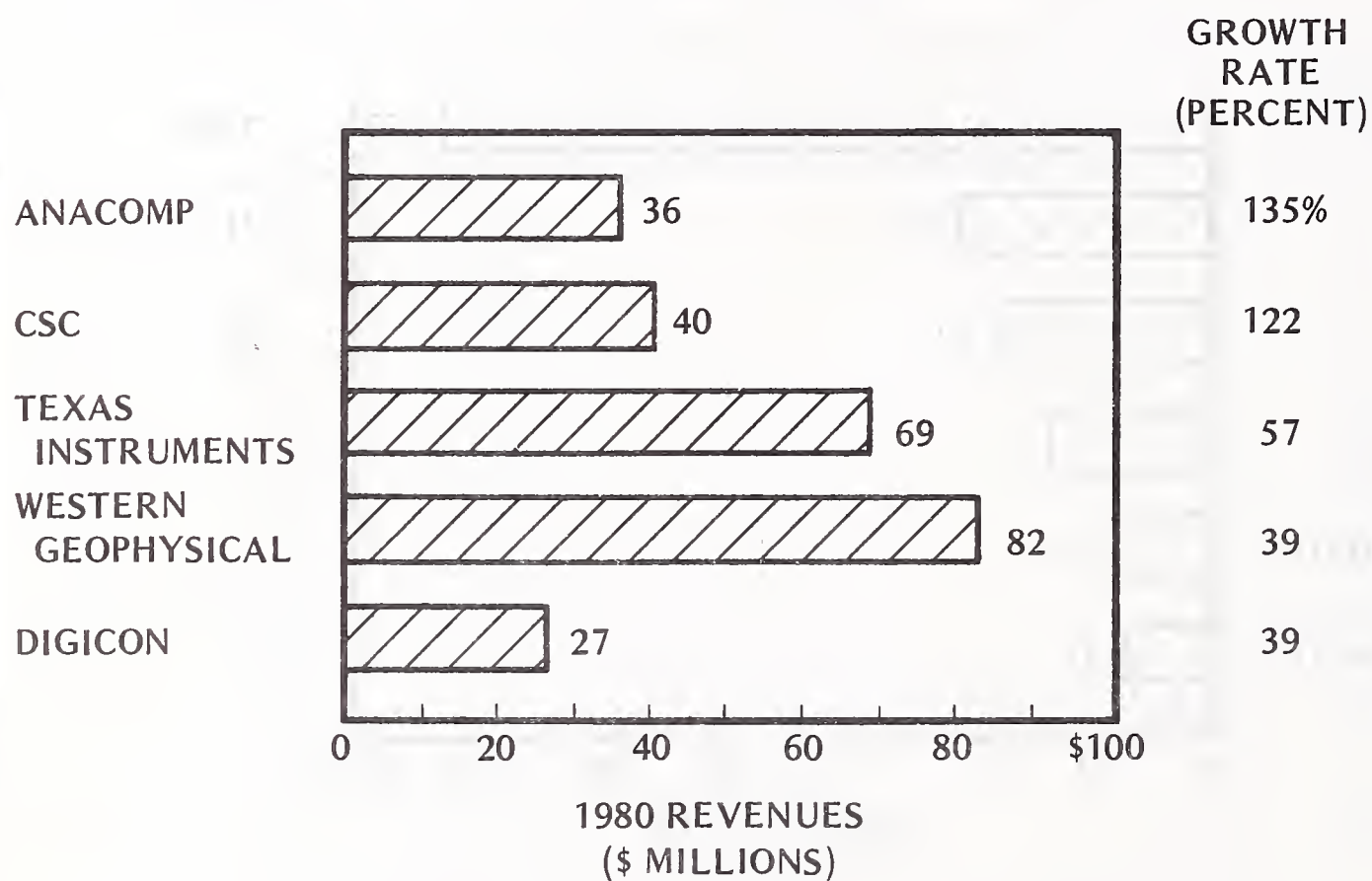
INPUT

INPUT

LARGEST SOFTWARE
PRODUCTS VENDORS

	1980 REVENUES ($ MILLIONS)	GROWTH RATE (PERCENT)
IBM	595	40%
CDC	80	14
UNIVAC	55	10
BURROUGHS	47	(6)
DEC	47	34

INPUT

- 37 -

MCP1P41
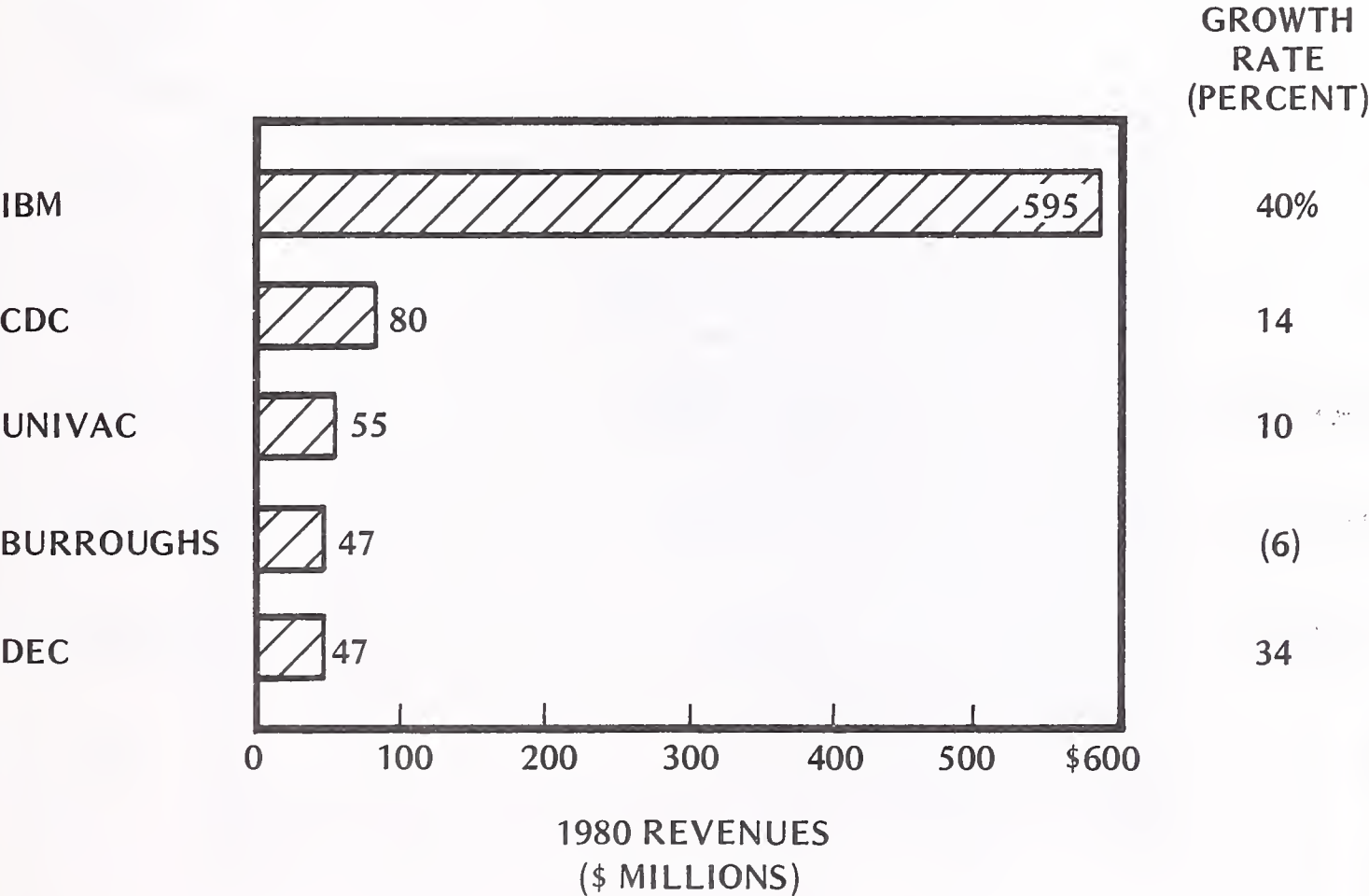
INPUT

LARGEST INDEPENDENT
SOFTWARE PRODUCT VENDORS

	1980 REVENUES ($ MILLIONS)	GROWTH RATE (PERCENT)
MSA	41	26%
UCC	27	40
INFORMATICS	26	3
PANSOPHIC	24	50
CULLINANE	21	62
ADR	20	38

1980 REVENUES
($ MILLIONS)

0   10   20   30   40 $50

INPUT

- 38 -

MCP1P42
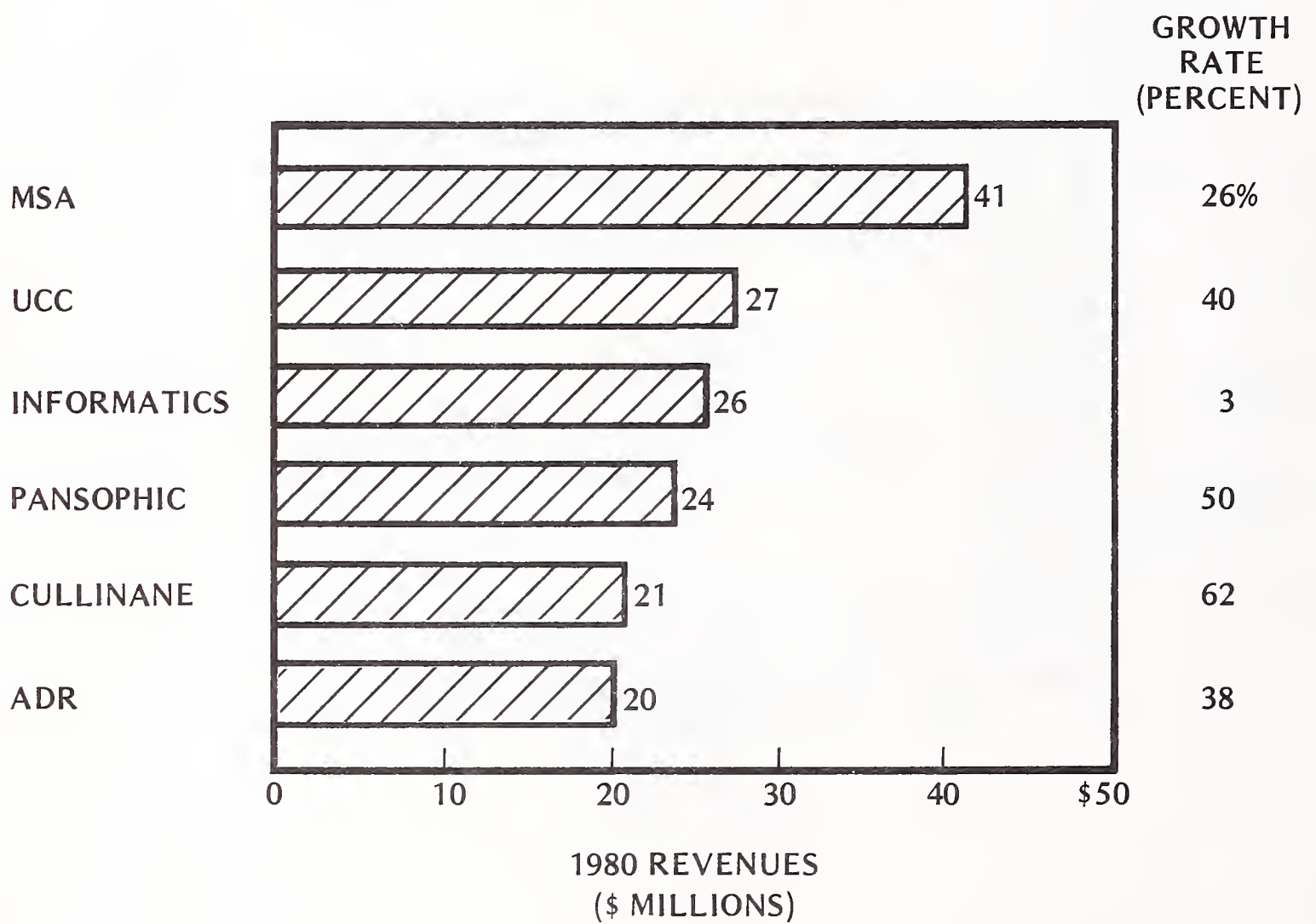
INPUT

FASTEST GROWING VENDORS
- SOFTWARE PRODUCTS OVER $10 MILLION

GROWTH RATE (PERCENT)

Vendor	1980 Revenues ($ Millions)	Growth Rate (Percent)
ANACOMP	10	276%
APPLE	10	100
McCORMACK & DODGE	14	99
WESTINGHOUSE	14	69
SOFTWARE AG	12	67

1980 REVENUES
($ MILLIONS)

MCP1P43
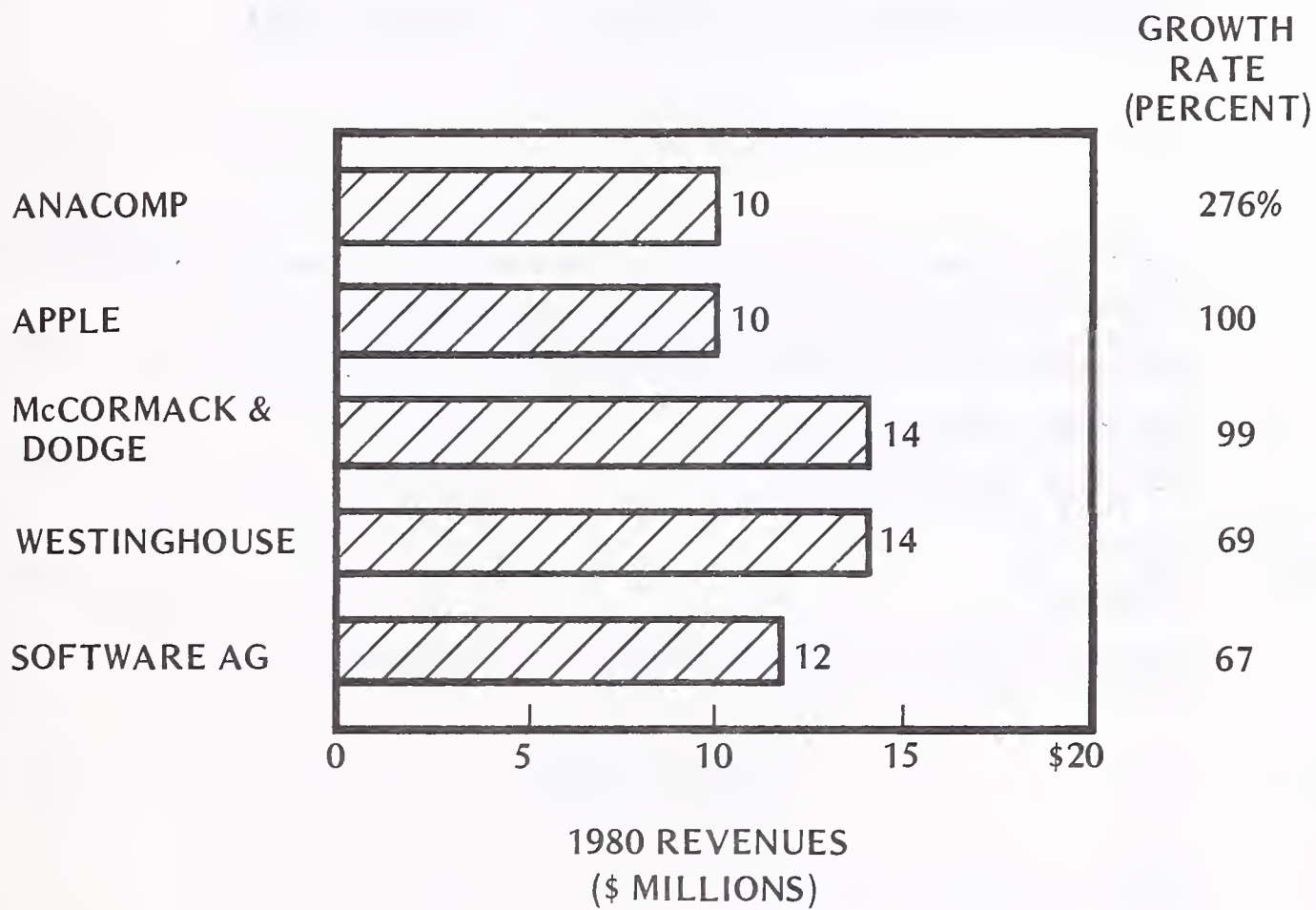
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LARGEST APPLICATIONS
SOFTWARE PRODUCT VENDORS

	1980 REVENUES ($ MILLIONS)	GROWTH RATE (PERCENT)
IBM	105	40%
MSA	41	26
KIRCHMAN	15	11

1980 REVENUES
($ MILLIONS)

INPUT

- 40 -

MCP1P44
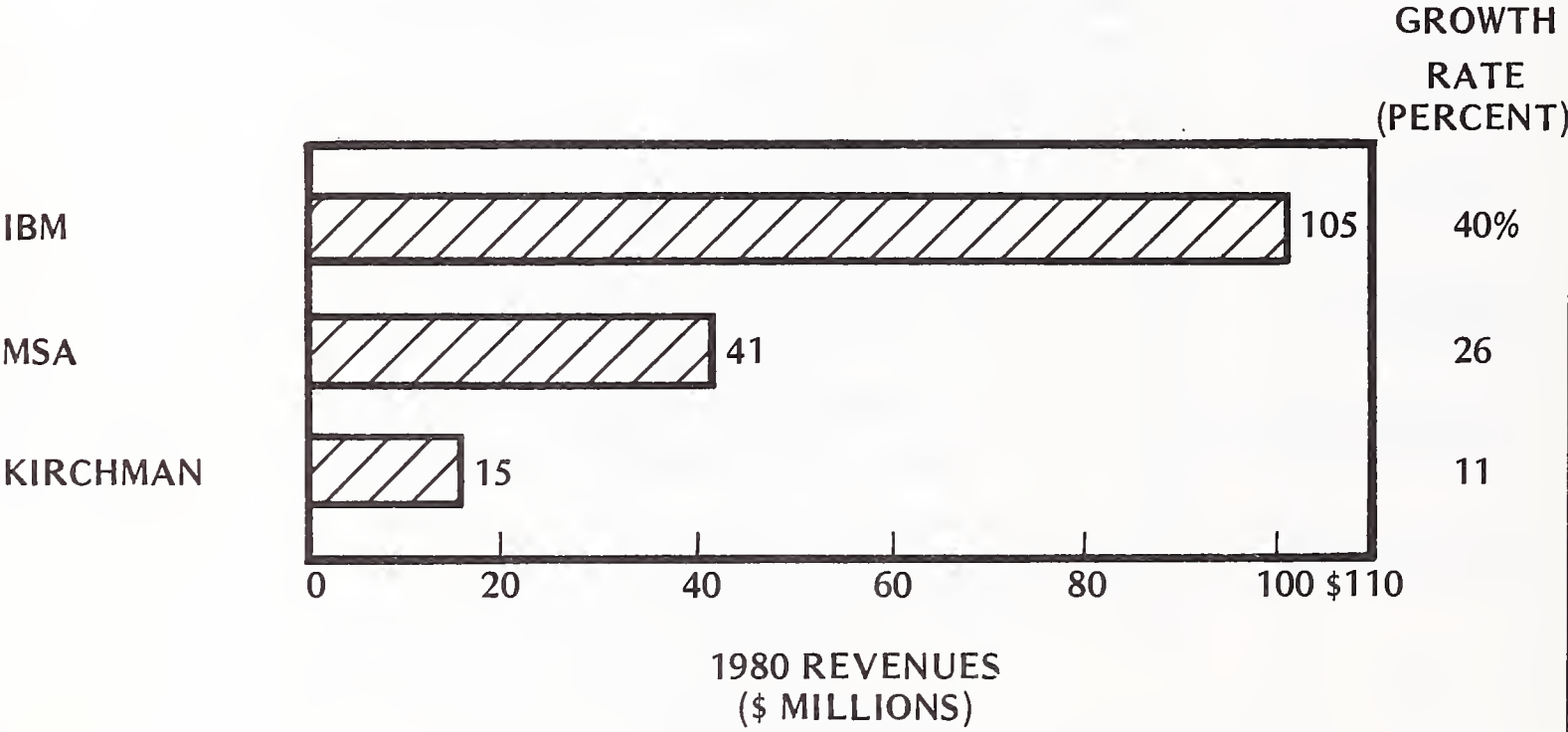
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LARGEST PROFESSIONAL
SERVICES VENDORS

	1980 REVENUES ($ MILLIONS)	GROWTH RATE (PERCENT)
CSC	337	24%
ARTHUR ANDERSEN	156	30
SDC	136	2
IBM	135	35
MITRE	124	25
EDS	88	27
PRC	77	21

1980 REVENUES
($ MILLIONS)

MCP1P45
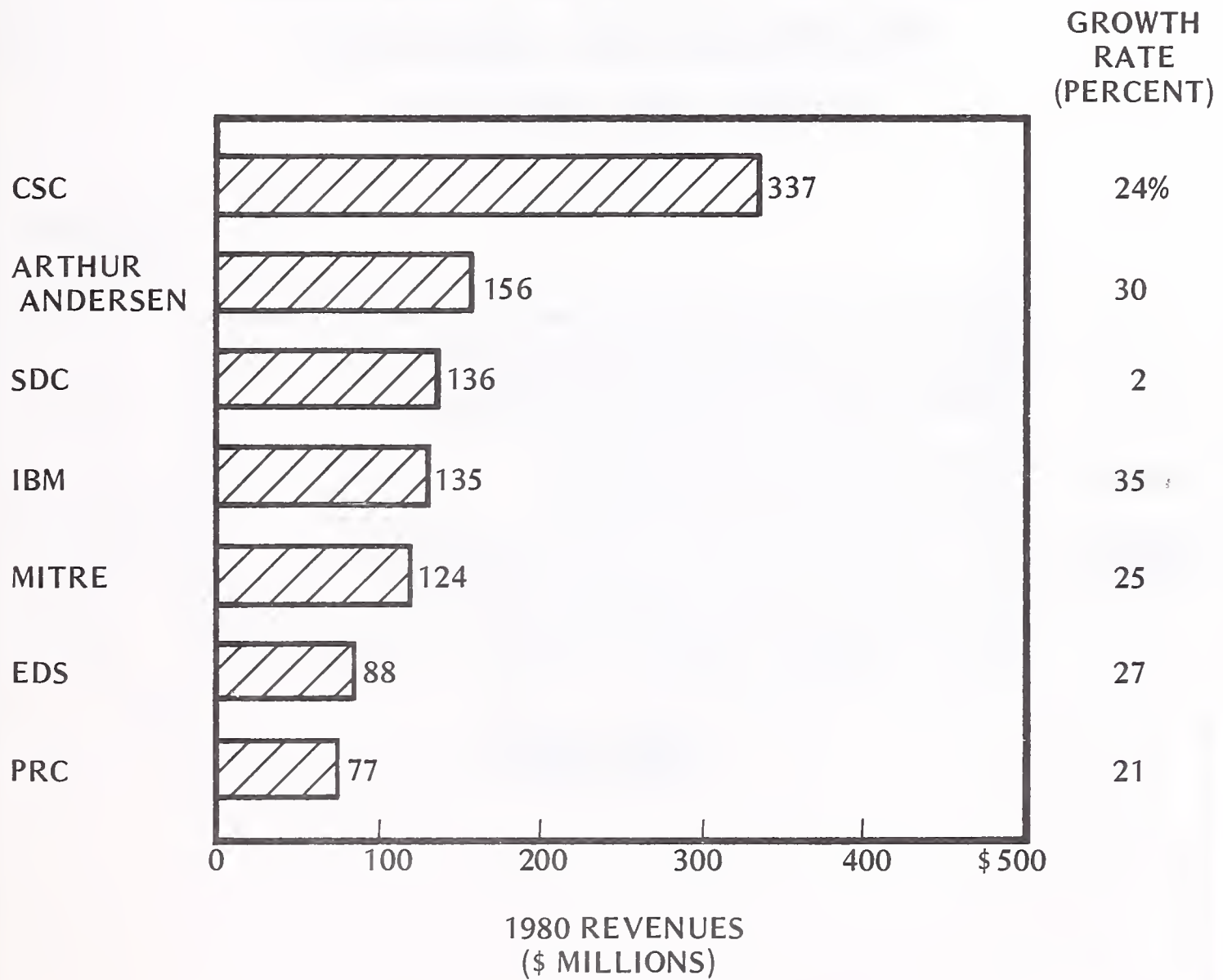
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FASTEST GROWING VENDORS
- PROFESSIONAL SERVICES
OVER $25 MILLION

GROWTH
RATE
(PERCENT)

C.A.C.I. ⟦37⟧ 79%

LAMBDA ⟦27⟧ 50

ERNST &
WHINNEY ⟦37⟧ 40

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0    10    20    30    40    $50
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1980 REVENUES
($ MILLIONS)

- 42 -

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INPUT

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MCP1P47
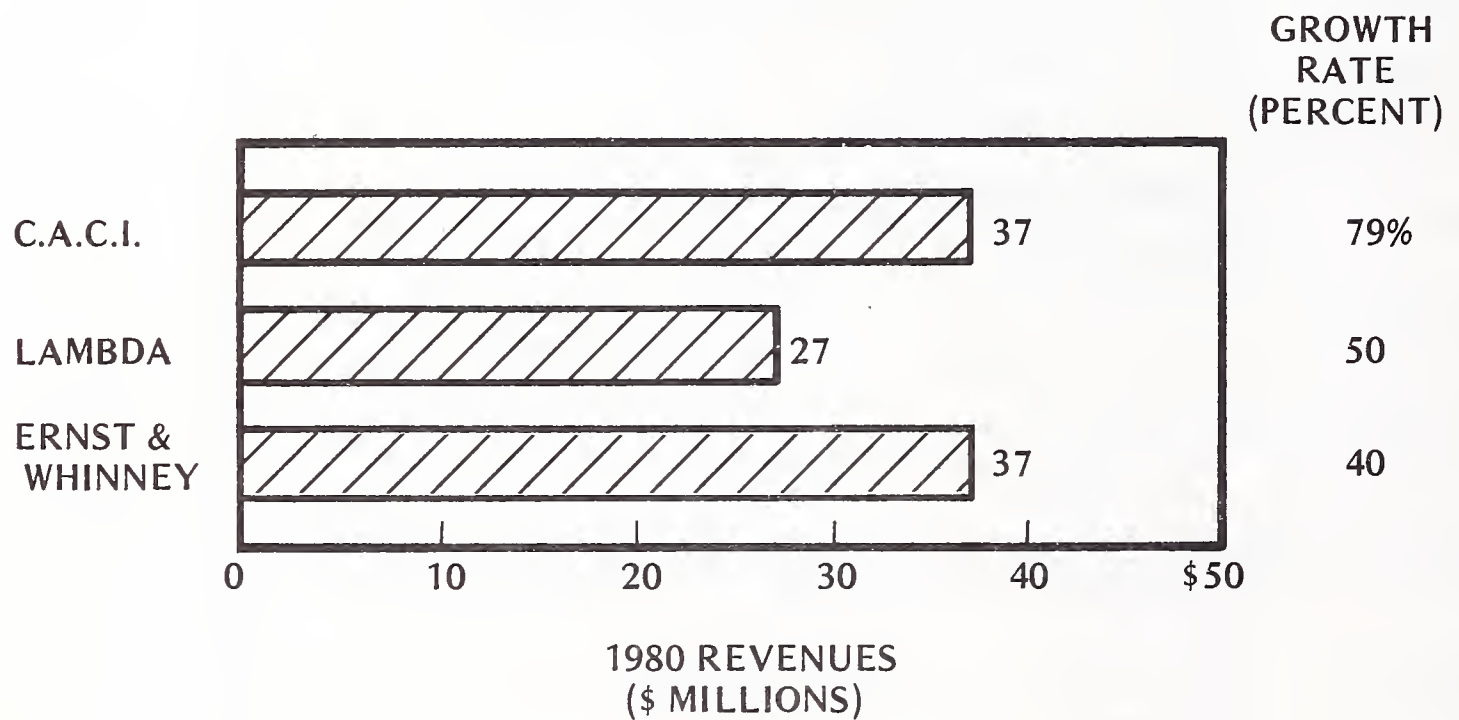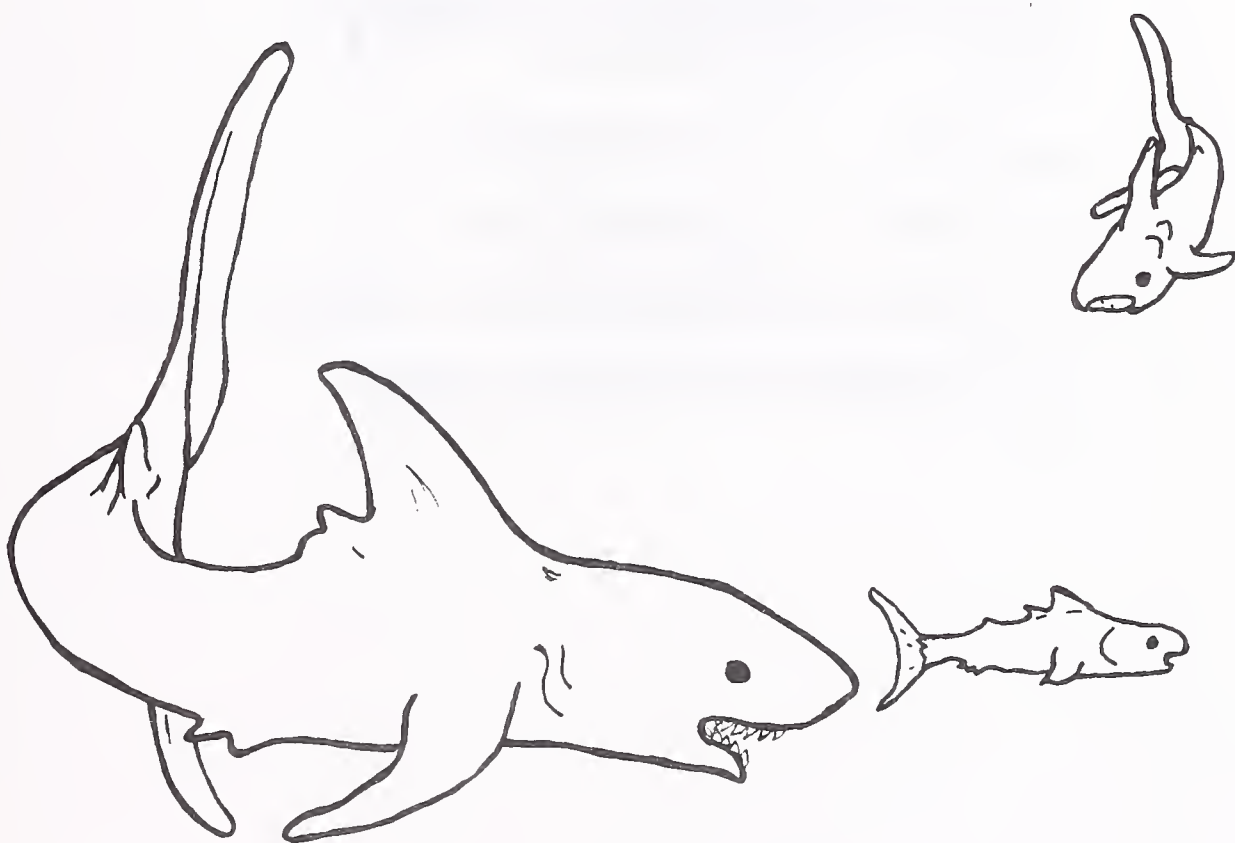
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ACQUISITION ACTIVITY

- 1979   107 ACQUISITIONS

- 1980   87 ACQUISITIONS

- 1981   ≈50 ACQUISITIONS (THROUGH AUGUST)

- ACQUISITIONS GETTING LARGER

- 44 -

MCP1P48

MAJOR ACQUISITIONS

ACQUIRED	ACQUIROR	VALUE
MDSI	SCHLUMBERGER	$187M
CALMA	G.E.	$100M
SDC	BURROUGHS	$ 98M
ISA	UNITED TELECOM	$ 41M
LAMBDA	GEISCO	$ 22M

MCP1P49

INPUT

MAJOR ACQUISITIONS (Cont.)

ACQUIRED	ACQUIROR	VALUE
SOURCE TELECOMPUTING	READERS DIGEST	$ 12M
DASD	CAP GEMINI	$ 11M
DATA CORPORATION OF AMERICA	ADP	$ 5M

MCP1P50

INPUT

INPUT

ACQUISITION ACTIVITY

ACQUIRED	ACQUIROR
TRANSPORTATION COMPUTING	
AUTOMATED SYSTEMS DESIGN	INFORMATICS
PROFESSIONAL SOFTWARE SYSTEMS	
CENTURION	EDS
MICROBAND	
ITT TRAVEL SERVICES	TYMSHARE
MCCI	SUN
PRAXA	XEROX

MCP1P51

INPUT

ACQUISITION ACTIVITY

ACQUIRED	ACQUIROR
PREDICASTS	INDIAN HEAD
COMPUTER APPLICATIONS CORPORATION	PIONEER HYBRID
COMPREHENSIVE COMPUTING	COMSAT
WORLDWIDE COMPUTER SERVICES	GENERAL DEVICES, INC.
WORLDWIDE SOFTWARE ASSOCIATION	OXFORD SOFTWARE CORP.

INPUT

OTHER ACQUISITIONS

ACQUIRED	ACQUIROR
SOFTWARE INTERNATIONAL	GEISCO
BANKING SYSTEMS, INC.	
ENERGY ENTERPRISES, INC.	
ISD	CDC
PEACHTREE SOFTWARE	MSA

OTHER ACQUISITIONS

ACQUIRED	ACQUIROR
EXECUTIVE SYSTEMS, INC. FLORIDA COMPUTER SYSTEMS	AMS
DSI	ANACOMP
RAPIDATA	NATIONAL DATA
BUNKER RAMO	ALLIED (CHEMICAL) CORP.

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. . . AND MORE TO COME

MCP1P55

MCP1P56

IV. REVIEW OF KEY ISSUES

- BUYER CHANGES
- OFFICE SYSTEMS
- ON-LINE SYSTEMS
- PERSONAL SYSTEMS
- OPTICAL STORAGE
- OTHER DEVELOPMENTS

BUYER CHANGES

MCP1P57

COMPONENTS OF THE TOTAL INFORMATION PROCESSING BUDGET

COMPUTER SERVICES

DISTRIBUTED PROCESSING

PER-SONAL COM-PUTERS

COMMUNICATIONS

APPLI-CATION SOFT WARE

EDP CONTROLLED BUDGETS

END USER TERMINALS

- PERSONNEL
- MAINFRAME PROCESSORS
- PERIPHERALS
- MINICOMPUTERS
- TERMINALS

- DATA COMMUNI-CATIONS
- SOFTWARE PACKAGES
- COMPUTER SERVICES
- SUPPLIES AND OTHER

PER-SONNEL

OFFICE AUTO-MATION

- 54 -

UCN
DI
INPU

PERSONNEL

Bar chart titled "PERSONNEL" showing proportion of EDP budget by year:
- 1986: 47, 50, 55
- 1980: 46
- 1974: 39

X-axis: PROPORTION OF EDP BUDGET (0 to 80%)

INPUT

TELECOMMUNICATIONS

PROPORTION OF EDP BUDGET

SOFTWARE PRODUCTS

Bar chart:

- **1986:** 5 (solid, hatched), extending to 8 (dashed)
- **1980:** 2
- **1974:** 1

Horizontal axis: 0 1 2 3 4 5 6 7 8%

PROPORTION OF EDP BUDGET

UCN1P14
P61

INPUT

INPUT

CENTRAL SYSTEMS

1986	17 ¦ 20
1980	23
1974	29

0   10   20   30%

PROPORTION OF EDP BUDGET

INF

OFFICE SYSTEMS

UCN1P28
P63

INPUT

OFFICE SYSTEMS

- COMMUNICATIONS PROBLEM

- COMPUTER AIDED MANAGEMENT

- MULTIPURPOSE SYSTEMS

- PERSONAL SYSTEMS MAJOR BREAKTHROUGH

– 60 –

BREAKDOWN OF OFFICE PRODUCT
AND SERVICE EXPENDITURES

MESSAGE
SERVICES
2%

DATA
PROCESSING
PRODUCTS
AND
SERVICES
22%

MAIL AND
COURIER
18%

WORD
PROCESSING
SYSTEMS
(INCLUDING
TYPEWRITERS)
5%

VOICE
COMMUNICATION
(HARDWARE AND
SERVICES)
44%
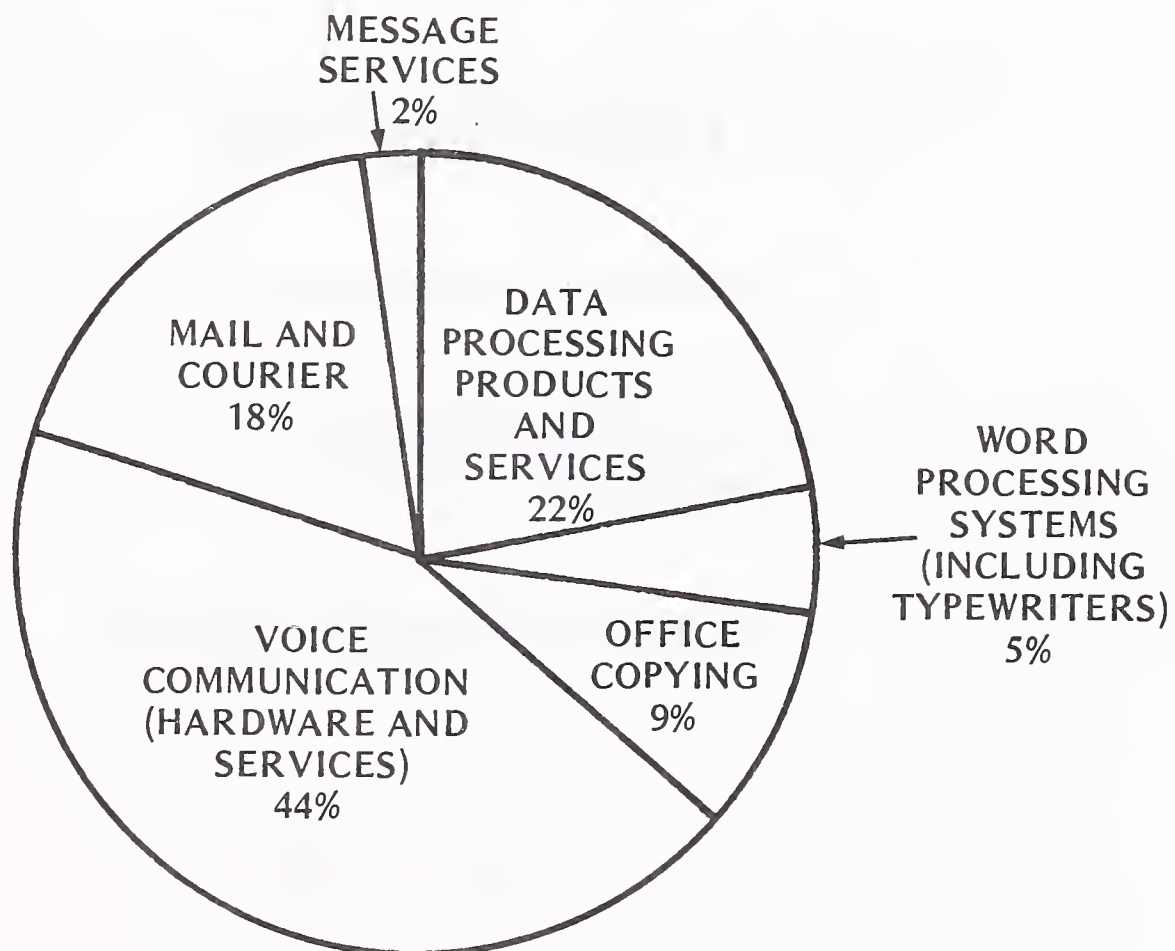
OFFICE
COPYING
9%

OFFICE SYSTEMS

- POTENTIAL CHANGE IS FRIGHTENING

- "PRODUCTIVITY POTENTIAL" (PP) MEASURE

- EACH OPERATION NEEDS ANALYSIS

PROFESSIONAL & TECHNICAL PP

LABOR EXPENSE ($ BILLIONS — 1978 $)

- 63 -

PROFESSIONAL AND TECHNICAL PP

ANALYSIS 125
65

MEETINGS 110
35

TELE-
PHONE 60
20

LABOR EXPENSE ($ BILLIONS — 1978 $)

☐ 1980
▨ 19XX
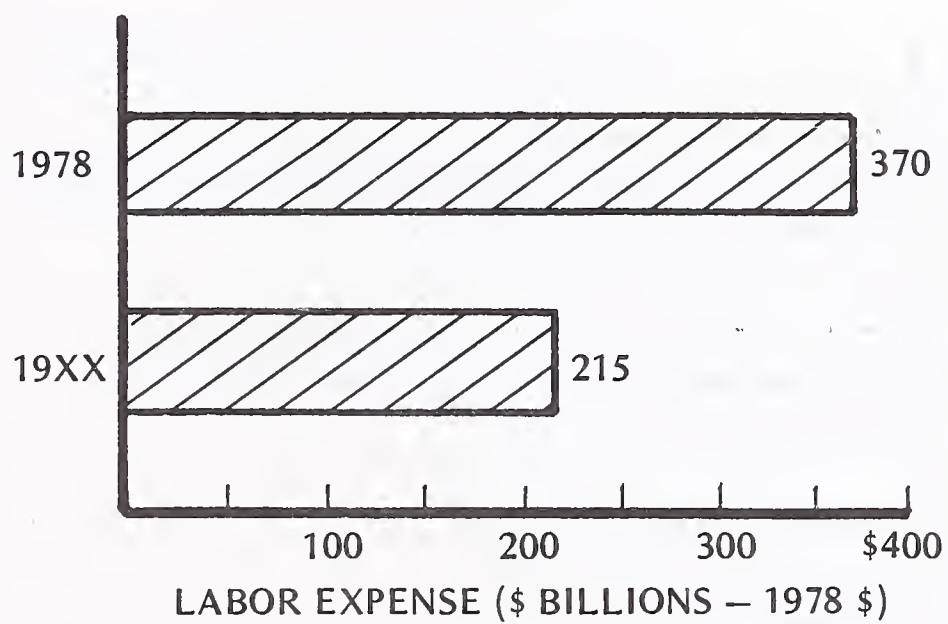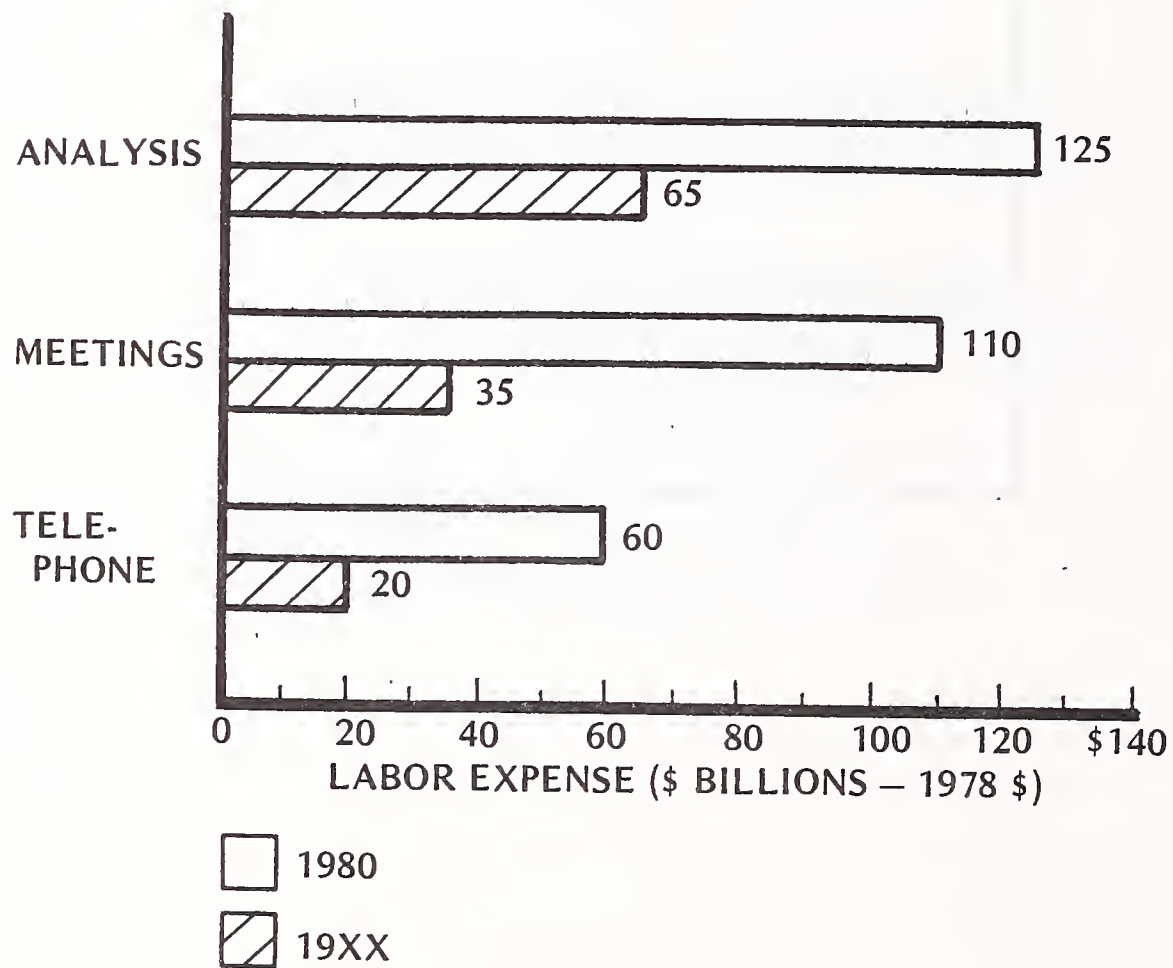
PROFESSIONAL AND TECHNICAL PP

- CURRENT MEETINGS 75% REPLACEABLE

- NEW PROCESSES 10X EFFICIENCY

- MEETINGS TRANSFER INFORMATION

- 65 -

UCN1P
P69

CLERICAL AND TYPING PP

HANDLING DOCUMENTS — 66, 17

ANALYSIS — 33, 8

TYPING — 33, 17

LABOR EXPENSE ($ BILLIONS — 1978 $)

0   20   40   60 $80

☐ 1978
▨ 19XX
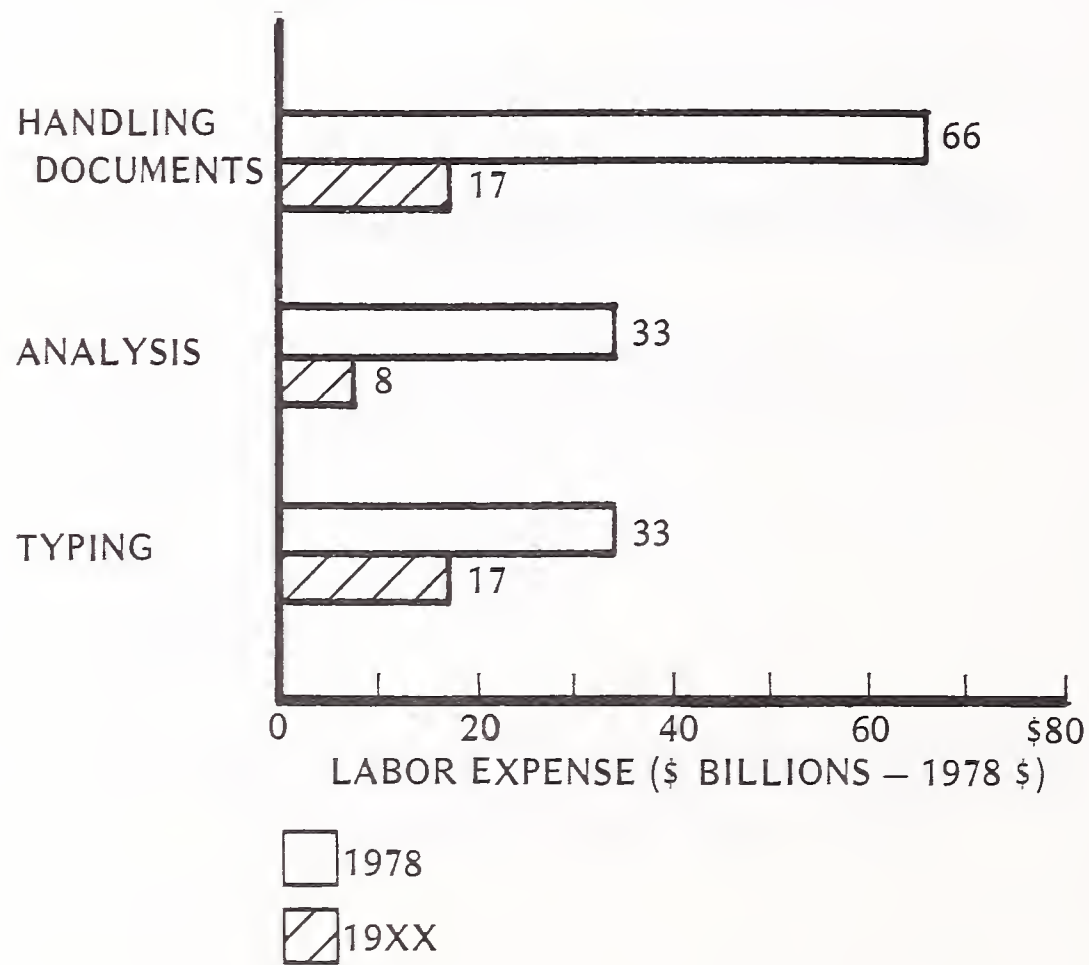
TELEPHONE CALLS

- REPLACED BY ELECTRONIC MAIL
  AND VOICE STORE/FORWARD

- REDUCTION IN PHONE NEEDS

- CONTROL IMPROVES

- EXTERNAL REMAINS

INPUT

INPUT

ON-LINE SYSTEMS

PAPER PREDOMINATES

- GROWTH OF NON-IMPACT PRINTING

- WILL DOMINATE THROUGH 1990s

- "EXTERNAL" PAPER HARD TO REPLACE

- EDP PAPER USE REPLACEABLE

- 69 -

INFORMATION ORGANIZATION

- 70 -
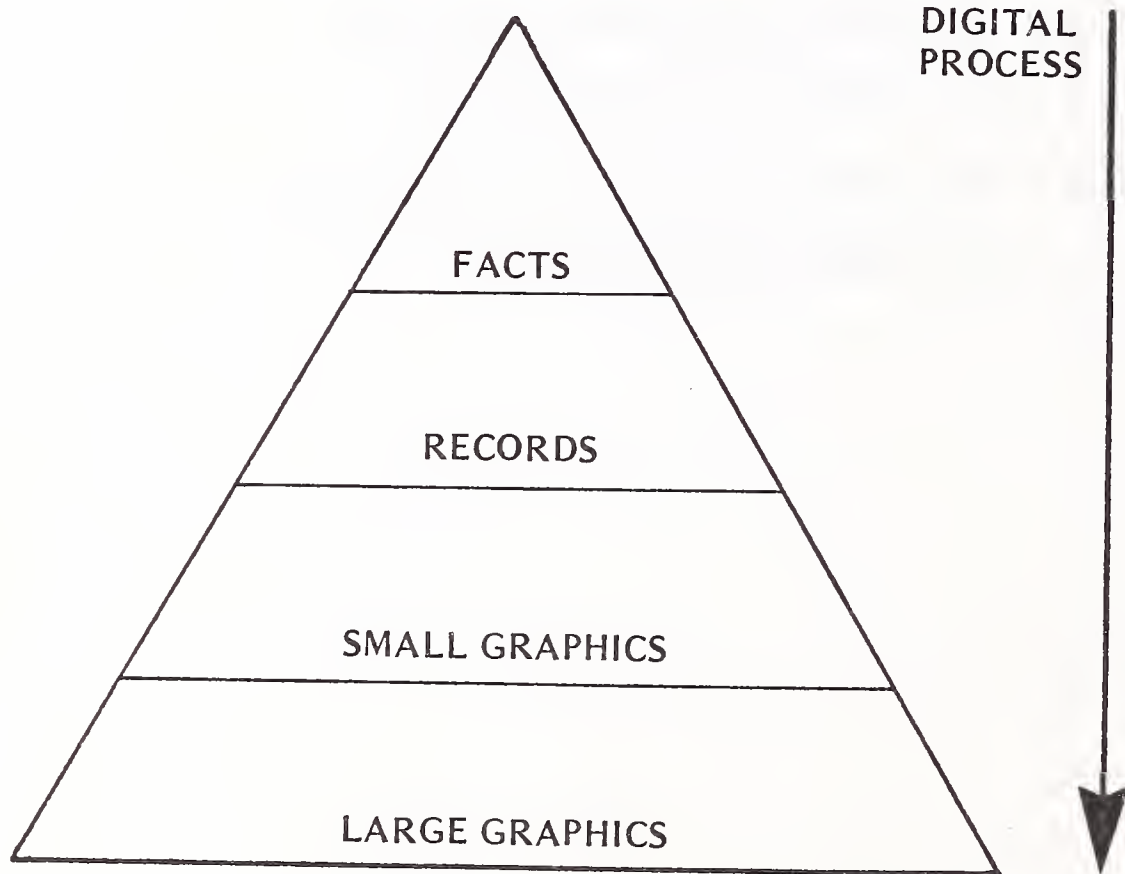
- FACTS BASES ESSENTIALLY SMALL

    - TELEPHONE LIST

    - ON-LINE NOW

    - CAN BE DYNAMIC

- RECORDS/TRANSACTION HISTORY

    - MOVING TO ON-LINE

    - DESCRIPTION OF ACTIONS

UCN1P61
P75

INPUT

- SMALL GRAPHICS

  - SIGNATURES

  - EXTRACTIONS

- LARGE GRAPHICS

  - FULL DOCUMENTS

  - PICTURES

- 72 -

VOLATILITY/IMAGE CONTENT

IMAGE CONTENT	DATA VOLATILITY		
	LOW	MEDIUM	HIGH
LOW	• GENERAL INTEREST BOOKS	• PERIODICAL INDICES • LEGAL CITATIONS	• STOCK QUOTA-TIONS
MIXED	• GEOLOGICAL DATA • ENGINEERING AND SCIENTIFIC DATA	• PRODUCT DESCRIP-TIONS • ECONOMIC TIME SERIES	• NEWS SERVICES
HIGH	• CARTOGRAPHIC DATA • ELECTRONIC PUBLISHING	• PATENT DESCRIP-TIONS	

INPUT

INPUT

PERSONAL SYSTEMS

INPUT

PERSONAL SYSTEMS

- 600,000 SYSTEMS IN 1986
  IN FORTUNE 500/50 COMPANIES

- "1 COMPUTER FOR EVERY 10 EMPLOYEES
  BY 1986"

- REPLACE TERMINALS/WORK STATIONS

- EQUIVALENT DEVELOPMENT TIME

  – MAINFRAMES, 20 YEARS

  – PERSONAL COMPUTERS, X YEARS

- 75 -

UCN1P66
P79

INPUT

PERSONAL SYSTEMS

- USED BY PROFESSIONALS

- USED BY MANAGERS/EXECUTIVES

- GRAPHICS ORIENTED

- LARGE PROCUREMENTS UNDERWAY

- "TROJAN HORSES"

PERSONAL SYSTEMS SOFTWARE

- NON-TRADITIONAL PRICING

- PORTABLE

- DISPOSABLE

- LISTED SOURCES - 2,000

    - NON-TRADITIONAL

    - FEW VIABLE

- 77 -

MCP1P81

SOFTWARE DISTRIBUTION CHANNELS

- USER GROUPS/CLUBS

- MANUFACTURERS

- STORES

- SYSTEM VENDORS

- EMPLOYEES

- SOFTWARE COMPANIES

- SOFTWARE BROKERS/PUBLISHERS

- SUPPLIES COMPANIES

- NON-COMPUTER COMPANIES

MCP1P8

INF

PERSONAL SYSTEMS APPLICATIONS

- NUMBER IDENTIFIED BY POTENTIAL USERS

  - MARKETING 22
  - MANUFACTURING 12
  - ENGINEERING 24
  - OPERATIONS 18
  - PLANNING 22
  - FINANCE 24
  - LEGAL 14
  - PERSONNEL 20

INPUT

MCP1P83

INPUT

APPLICATIONS - TRADITIONAL

- ACCOUNTING

- PAYROLL

- INVENTORY MANAGEMENT

- STATISTICS

- ENGINEERING/SCIENTIFIC

- 80 -

APPLICATIONS - CONTEMPORARY

- TEXT PROCESSING

- ELECTRONIC MAIL

- PLANNING

- EDUCATION

- DECISION SUPPORT SYSTEMS

APPLICATIONS - PERSONAL

- FORECASTING

- PROJECT SCHEDULES

- CALENDARS

- LISTS

- CALCULATIONS

- 82 -

MCP1

INP

SOFTWARE PROTECTION

- LIKE BOOKS

- VENDORS MUST BE AGGRESSIVE

- 83 -

MCP1P87

PERSONAL COMPUTER VENDORS

- IBM

- APPLE

- XEROX

- COMMODORE

- AT&T (?)

- RADIO SHACK

- HP

MCP1P88

INF

IBM PERSONAL COMPUTER

- IBM ASSEMBLED
  - INTEL 8088
  - EPSON PRINTER
  - TANDON DISKETTE
  - HITACHI DISPLAY
- DEPOT MAINTENANCE

- 85 -

MCP1P89

IBM PERSONAL COMPUTER SOFTWARE

- MICROSOFT: BASIC 80 AND ADVENTURE

- DIGITAL RESEARCH: CP/M

- PERSONAL SOFTWARE: VISICALC

- INFORMATION UNLIMITED SOFTWARE:
  EASY WRITER

- PEACHTREE SOFTWARE: ACCOUNTING

- PROGRAMS PROVIDED "AS IS"

IBM PERSONAL COMPUTER

- SYSTEM PRICE $3,500 AND UP

- IBM COMMUNICATIONS COMPATIBLE

    - 3270 (SNA)

    - ASCII COMMUNICATIONS

- RECOGNIZES SMALL COMPUTERS FOR
  CORPORATE USE

- 87 -

MCP1/P91

NON-TRADITIONAL IBM APPROACH

- PRODUCT "MANUFACTURING"

- DISTRIBUTION CHANNELS

  - EMPLOYEES

  - SEARS

  - COMPUTERLAND

  - IBM

- MAINTENANCE

- APPLICATIONS DEVELOPMENT

- 88 -

MCP1P

INF

FUTURE

- NETWORKING
    - LOCAL
    - REMOTE
- 8 $\longrightarrow$ 16 $\longrightarrow$ 32 BIT
- IS&R/DBMS
- PROGRAM GENERATORS
- VOICE/VIDEO PROCESSING
- OPTICAL STORAGE

- 89 -

MCP1P9

PERSONAL COMPUTERS
ARE NOT TOYS BUT...

MCP1P9

INP

DON'T FORGET THE GAMES

"TRAINING THE NEXT GENERATION OF WARRIORS"

OPTICAL STORAGE DEVELOPMENTS

CHARACTERISTICS

- READ AND READ/WRITE

- DISCONTINUITY IN PRICE/PERFORMANCE

- APPLICATION AND PROCESSING IMPACTS

- FUNCTIONAL AND MANAGEMENT IMPACTS

INPUT

INFORMATION STORAGE
AND RETRIEVAL

- REVOLUTIONIZE ON-LINE DATA BASE MARKET

- IN CONJUNCTION WITH COMMUNICATIONS
  SERVICES

- INCLUDES IMAGES

FUNCTIONAL AND
MANAGEMENT IMPACTS

- INITIALLY REGARD AS ARCHIVAL/BACK-UP

- WILL STIMULATE MASSIVE INCREASE IN COMPUTING

- COMMUNICATIONS COSTS INCREASE

- TOTAL STORAGE COSTS MAY STAY SAME

- CATALYST FOR DECENTRALIZATION

- 95 -

FUNCTIONAL AND MANAGEMENT IMPACTS

- DATA SECURITY

    - PERMANENCY AN ADVANTAGE

    - COMPACTNESS DISADVANTAGE

    - SOPHISTICATED TRACKING NEEDED

- OFFICE-OF-THE FUTURE

INPUT

IMPACTS

- SHORT TERM - ACCELERATION

- MID-TERM - REVOLUTION

- IBM'S TIMING IS UNCERTAIN

    - IMPACT ON INSTALLED BASE

    - "MINICOMPUTER DEBACLE" EXAMPLE

INPUT

- 97 -

UCN1P48
P101

INPUT

OPTICAL STORAGE TIMEFRAME

- INITIAL ANNOUNCEMENT 1982

  – IBM COMPATIBLE

  – DISK SUPPLIER

- ANNOUNCEMENTS FROM NON-DISK VENDORS IN 1982

- INITIAL SHIPMENTS 1983

- IBM ANNOUNCEMENT 1983

  – IBM SHIPMENT 1984 LATE

  – PC SHIPMENTS 1986

OTHER DEVELOPMENTS

INPUT

MCP1P103

INPUT

DATA BASE MACHINES (DBM)

- BACK-END PROCESSORS

- DISTRIBUTED PROCESSORS

- SMART PERIPHERALS

- 100 -

DBM VENDORS

- SET THEORETIC INFORMATION SYSTEMS (STIS)

- SOFTWARE AG

- COMSHARE

- BRITTEN-LEE

INPUT

DB ORGANIZATION

- HOST SYSTEMS FOR:

    - DIRECTORIES

    - BACK-UP

    - HIGH-SECURITY DEPOSIT

    - INTER DB COMPATIBILITY

    - CONTROL

INPL

DB ORGANIZATION

- REMOTE SYSTEMS

  - USER FRIENDLY

  - NEW DBMS

  - DISTRIBUTED DBM

  - FAST GROWTH

- 103 -

INPU

FORECASTS FOR IBM

- IMS HOST

- "X" AT NODES

- BRIDGE BETWEEN THEM

LARGE MAINFRAME DEVELOPMENTS

- NEW IBM PRODUCT MID-1982
- 1984 LARGE MAINFRAME PRICE REDUCTIONS
    - ACSYS/STC PRODUCTS
    - REVENUE ENHANCEMENT ELSEWHERE
- AMDAHL/NAS REMAIN VIABLE

CUSTOM SYSTEMS

- INCREASING PRESSURE FOR CUSTOM SYSTEMS

- DRAMATIC PERFORMANCE IMPROVEMENT

- "SYSTEM" GENERATORS

- DEFENSE DEPARTMENT EXAMPLES

- MAINTENANCE ISSUE

V. INFORMATION SERVICES INDUSTRY

- FORECASTS

- BUSINESS GRAPHICS

- ENERGY INDUSTRY MARKETS

- APPLICATIONS SOFTWARE PRODUCT MARKETS

- ON-LINE DATA BASE MARKETS

FORECASTS

ASSUMPTION

- 9.8% INFLATION RATE
  (PRODUCTION PRICE INDEX FORECAST)

- DEFLATORS DIFFERENT FOR EACH
  TYPE OF SERVICE
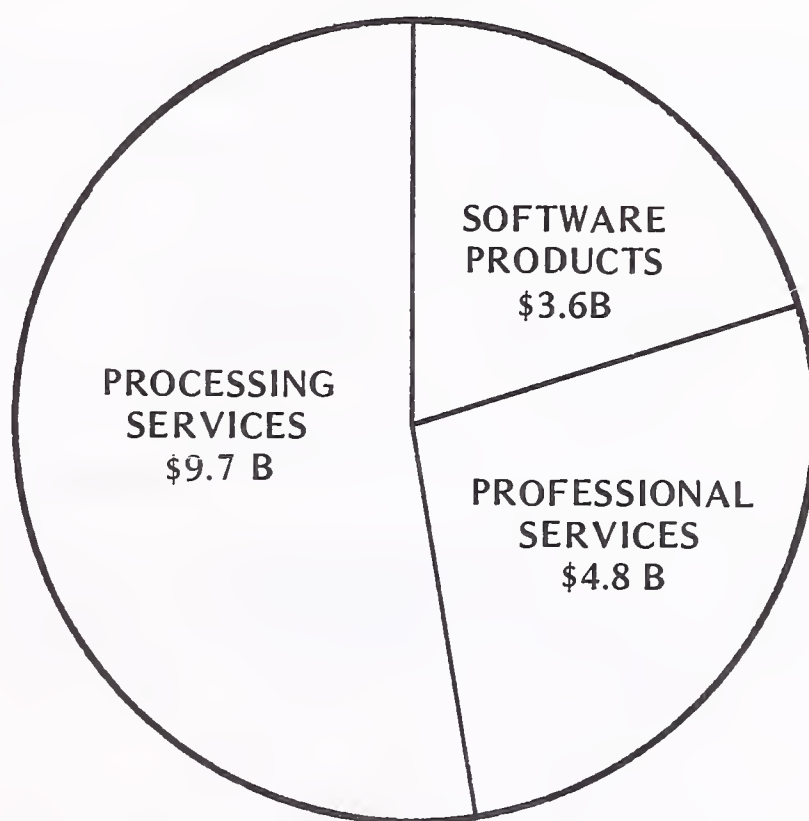
MCP1P113

INP

INFORMATION SERVICES INDUSTRY

1981

SOFTWARE PRODUCTS $3.6B

PROCESSING SERVICES $9.7 B

PROFESSIONAL SERVICES $4.8 B

$18 BILLION

INPUT

MCP1P114

INPUT

INFORMATION SERVICES INDUSTRY

1986

PROCESSING
SERVICES
$21 B

SOFTWARE
PRODUCTS
$15 B

PROFESSIONAL
SERVICES
$17 B
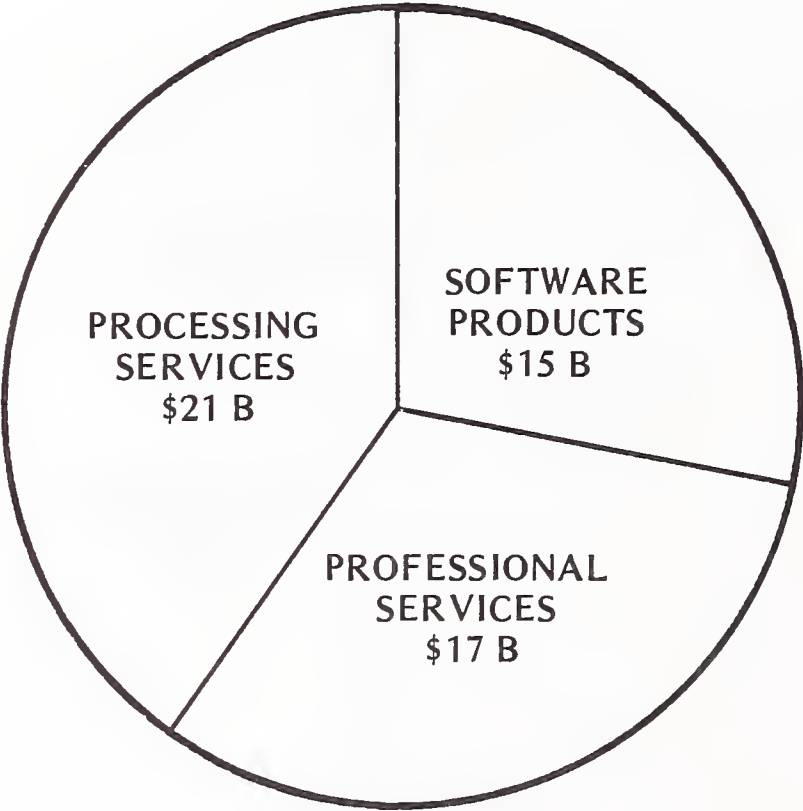
$53 BILLION

U.S. INFORMATION SERVICES INDUSTRY SIZE - CHANGES 1980/1981
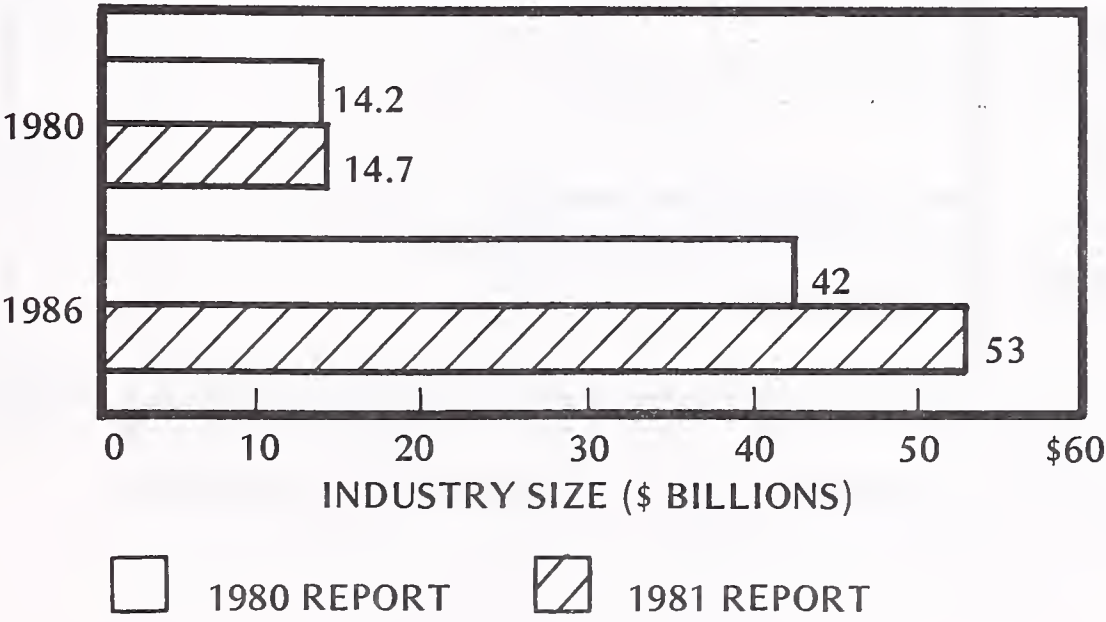
INDUSTRY SIZE ($ BILLIONS)
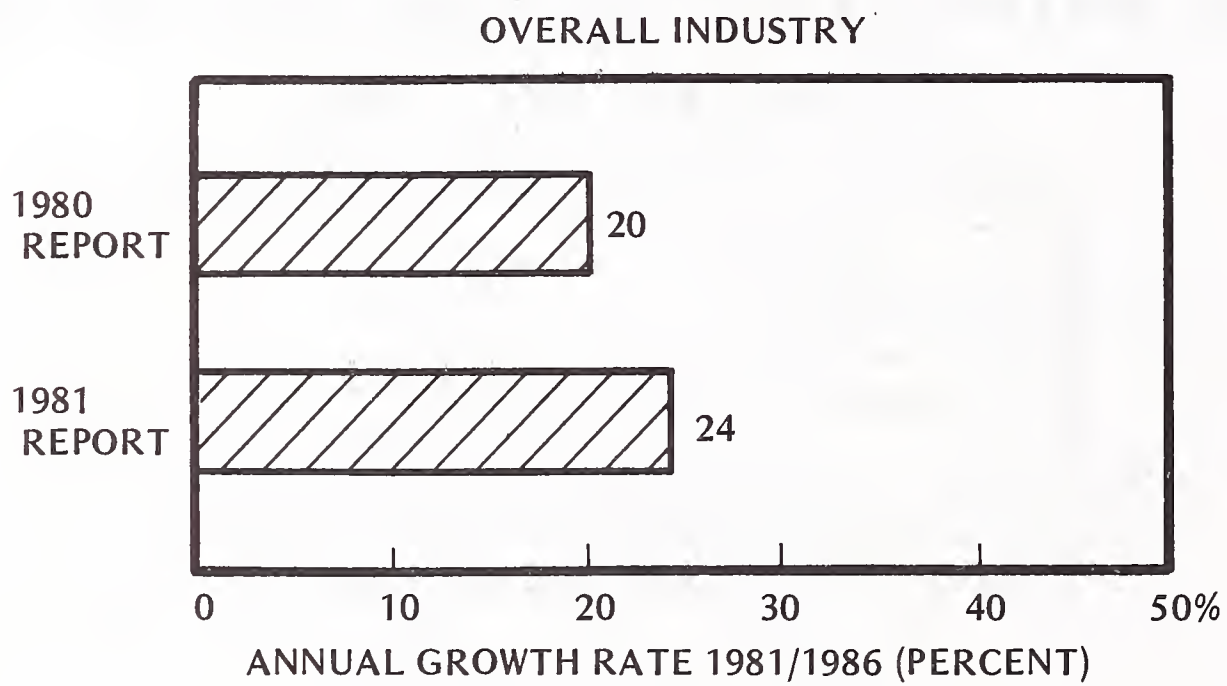
1980: 14.2, 14.7
1986: 42, 53

☐ 1980 REPORT   ▨ 1981 REPORT

INPUT

- III -

MCP1 P116

INPUT

IS MARKET GROWTH FORECASTS
- CHANGES 1980/1981

OVERALL INDUSTRY

ANNUAL GROWTH RATE 1981/1986 (PERCENT)

MCP1

INPl

IS MARKET GROWTH FORECASTS
- CHANGES 1980/1981

PROCESSING SERVICES — 17 / 17

SOFTWARE PRODUCTS — 29 / 33

PROFESSIONAL SERVICES — 17 / 29

0   10   20   30   40   50%
ANNUAL GROWTH RATE   1981/1986 (PERCENT)

☐ 1980 REPORT   ▨ 1981 REPORT

MCP1 P118

INPUT

PROCESSING SERVICES

1981

FM
$1.4 B
21% AAGR

RCS
$5.0 B
21% AAGR

BATCH
$3.3 B
9% AAGR

$9.7 BILLION

MCP1 P119

INPU

PROCESSING SERVICES

1986

FM
$3.5B

RCS
$12.7 B

BATCH
$5.1 B

$21 BILLION

MCP1 P120

INPUT

SOFTWARE PRODUCTS

APPLICA-
TIONS

1.7

5.5

(27% AAGR)

(38% AAGR)

SYSTEMS

1.9

9.5

0   1   2   3   4   5   6   7   8   9 $10

MARKET ($ BILLIONS)

☐ 1981   ▨ 1986

- 116 -

MCP1 P121

INP

PROFESSIONAL SERVICES
1981

FM
$0.5 B
12% AAGR

SERVICES
$4.3 B
30% AAGR

$4.8 BILLION

MCP1 P122

INPUT

PROFESSIONAL SERVICES
1986

SERVICES
$16.0 B

FM $0.8 B

$16.8 BILLION

MCP1 P12:

INP

BUSINESS GRAPHICS

- 119 -

MCP1P124
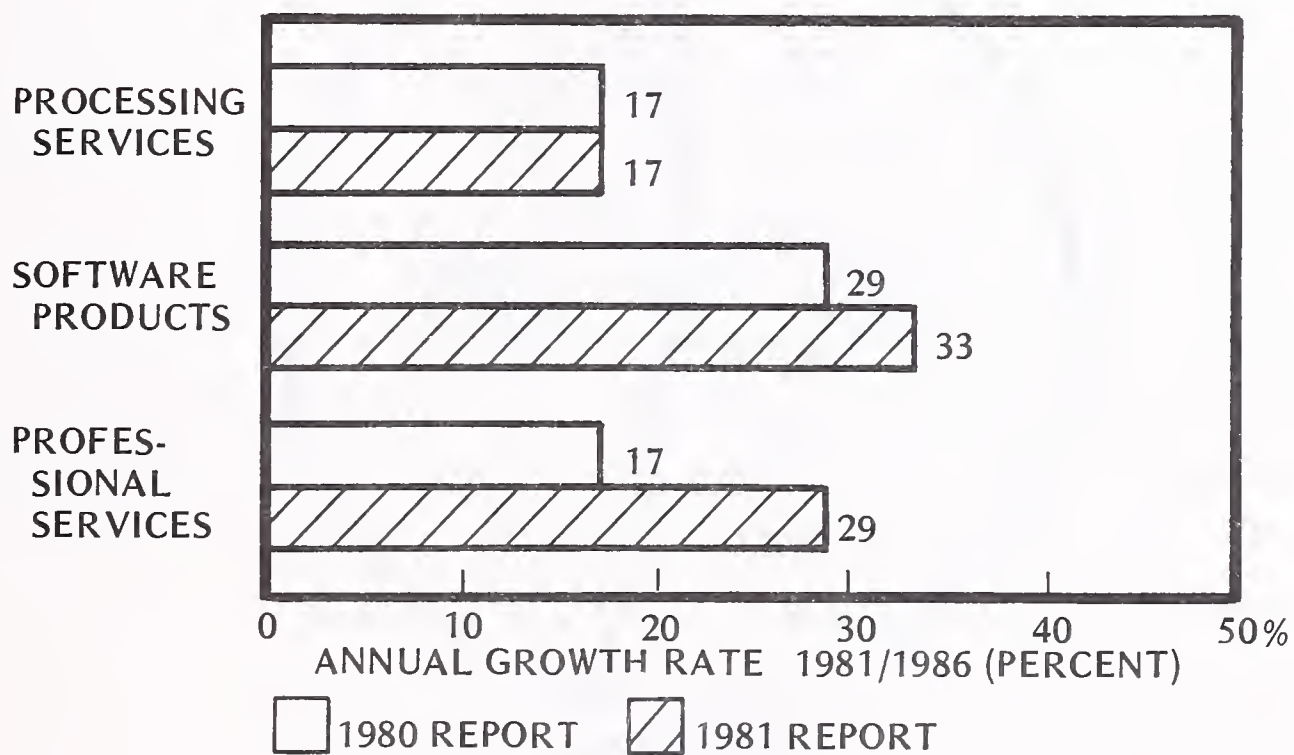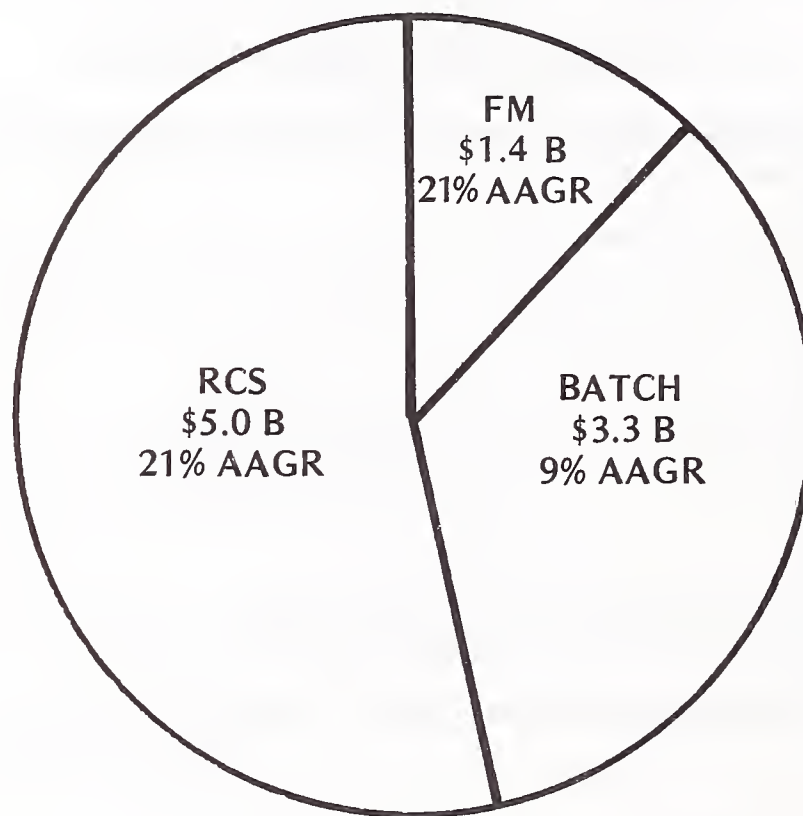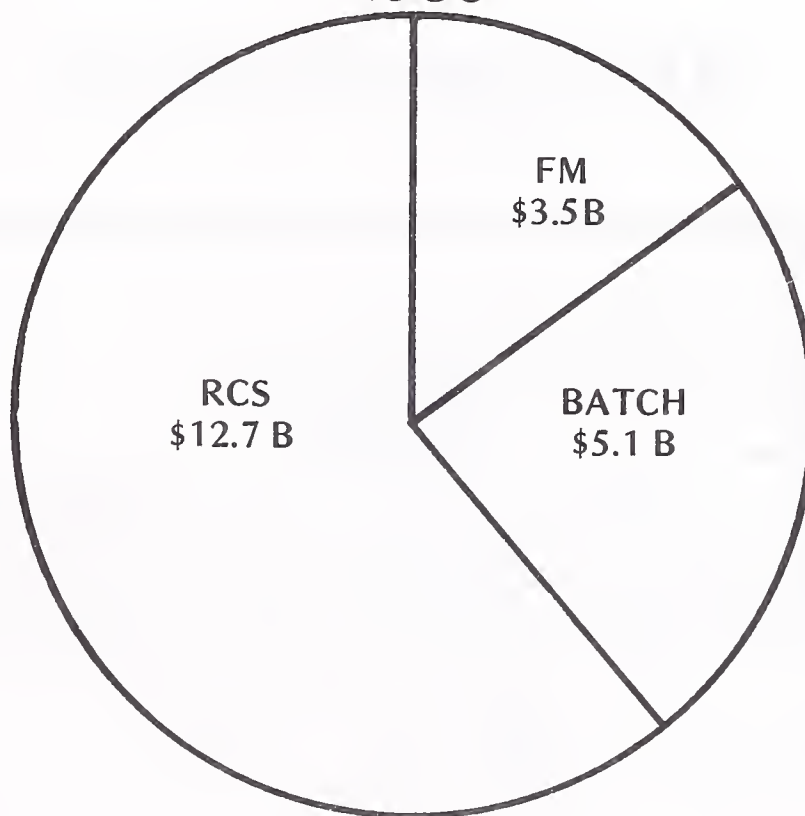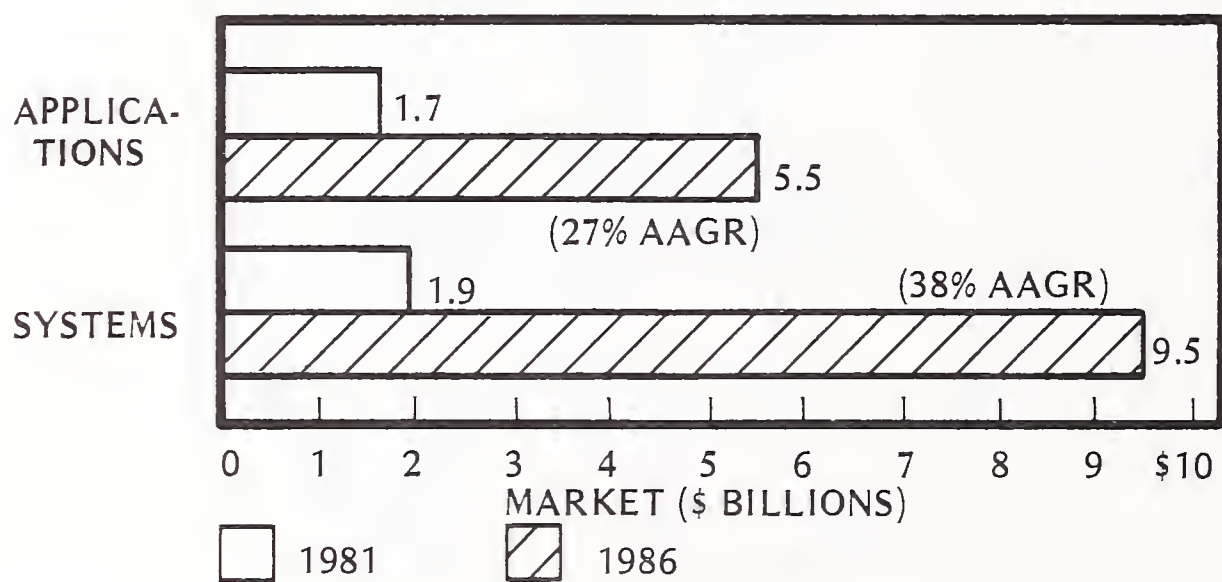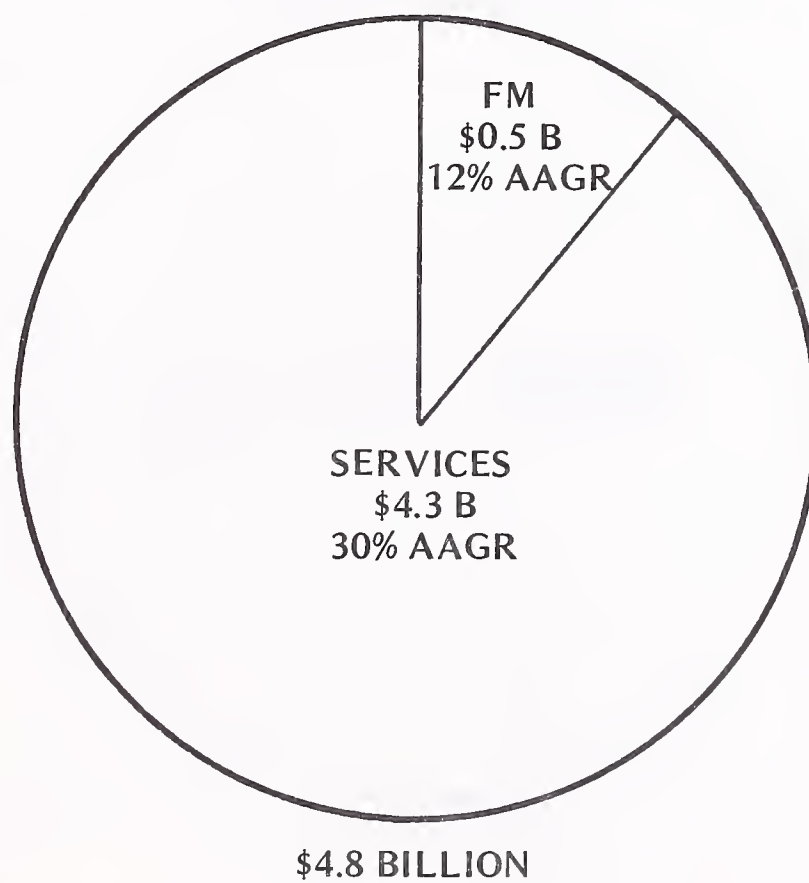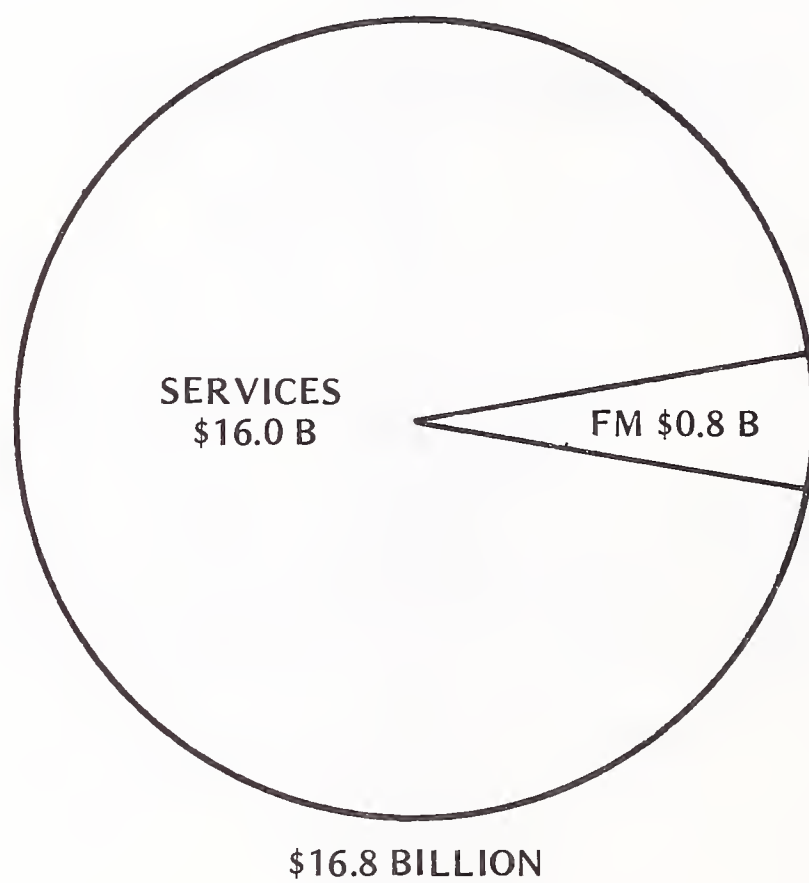
BUSINESS GRAPHICS RCS REVENUES

- 120 -

INPUT

MCP1 P125
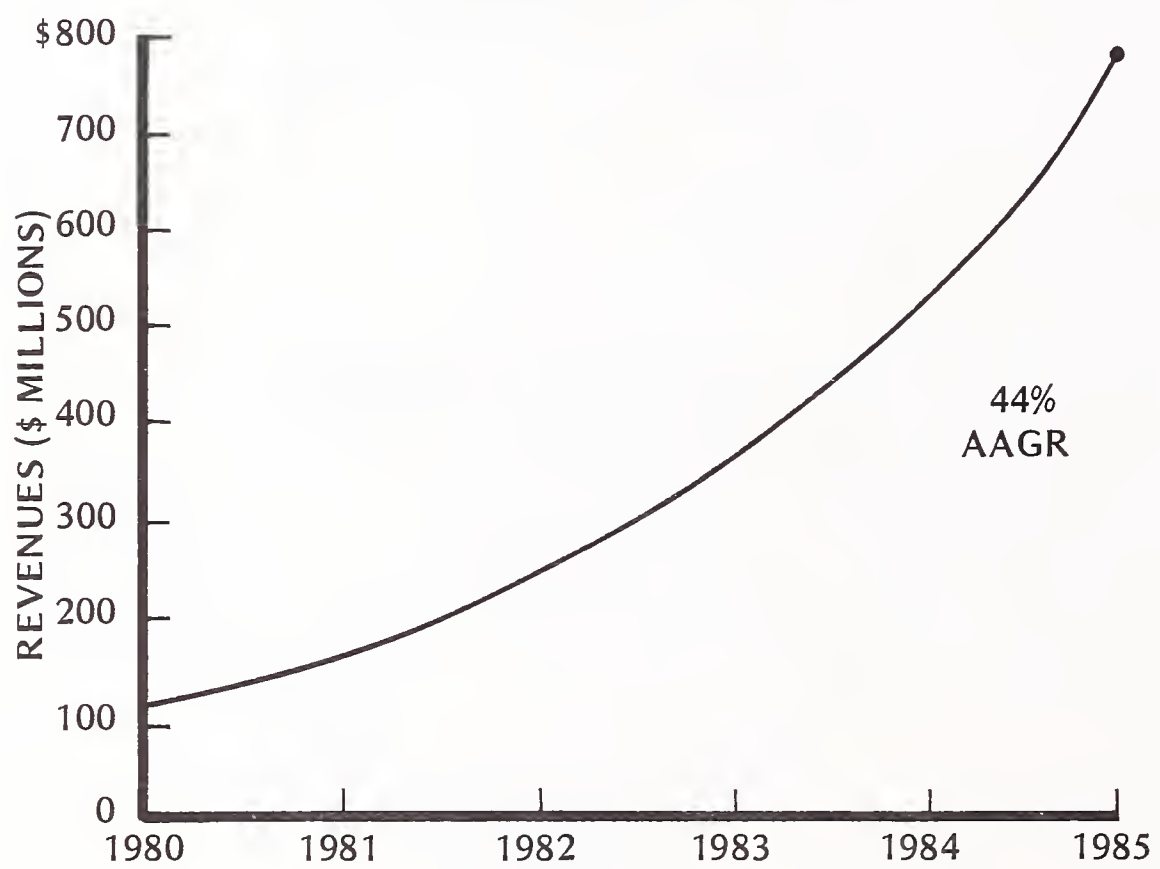
BUSINESS GRAPHICS APPLICATIONS

	Percent of Users
REPORTING FOR SENIOR MANAGEMENT	85
FINANCIAL ANALYSIS	85
PLANNING AND FORECASTING	80
MARKETING	65
PROJECT MANAGEMENT	55
OPERATIONS	50

PERCENT OF USERS

- 121 -

MCP1 P126
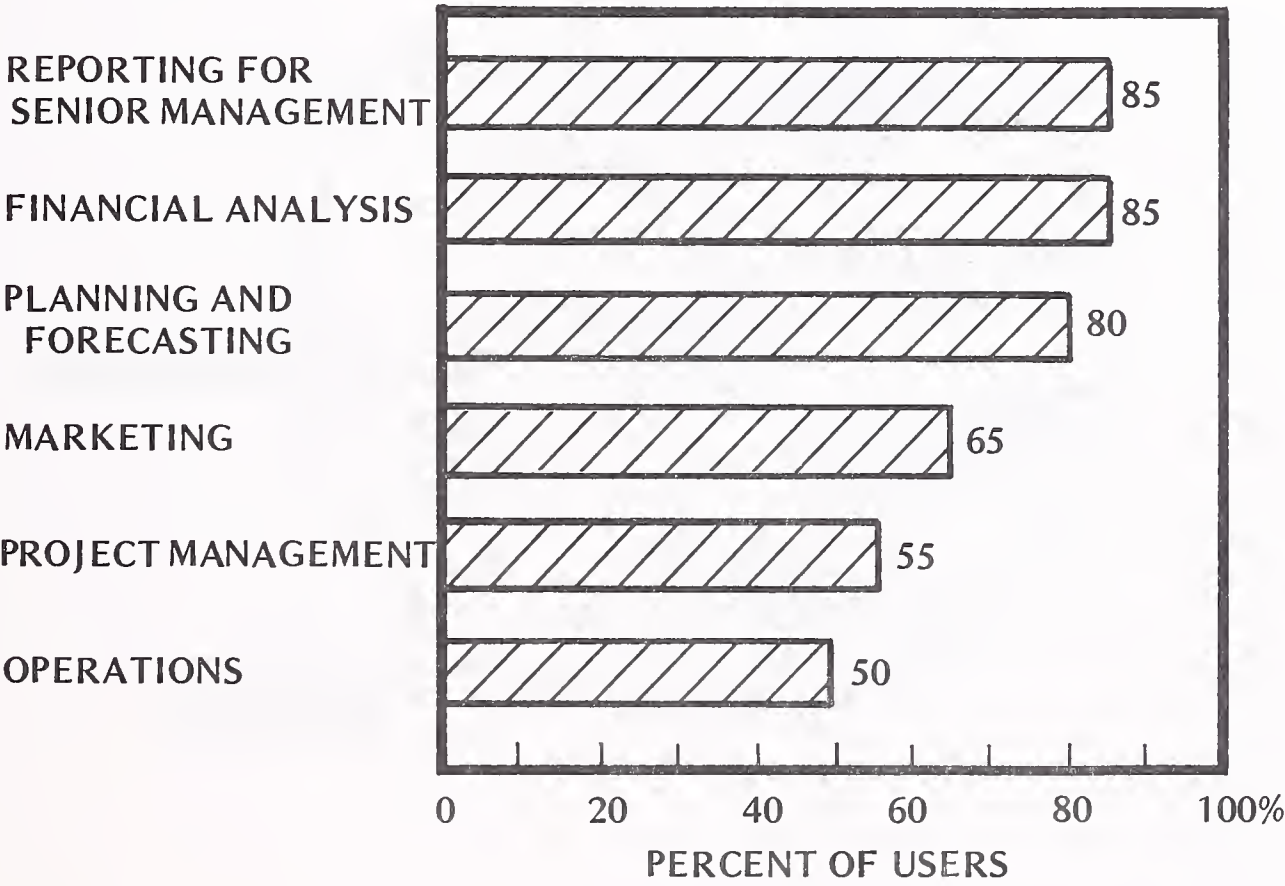
SOURCES OF
BUSINESS GRAPHICS REVENUES

MCP1P12

INP
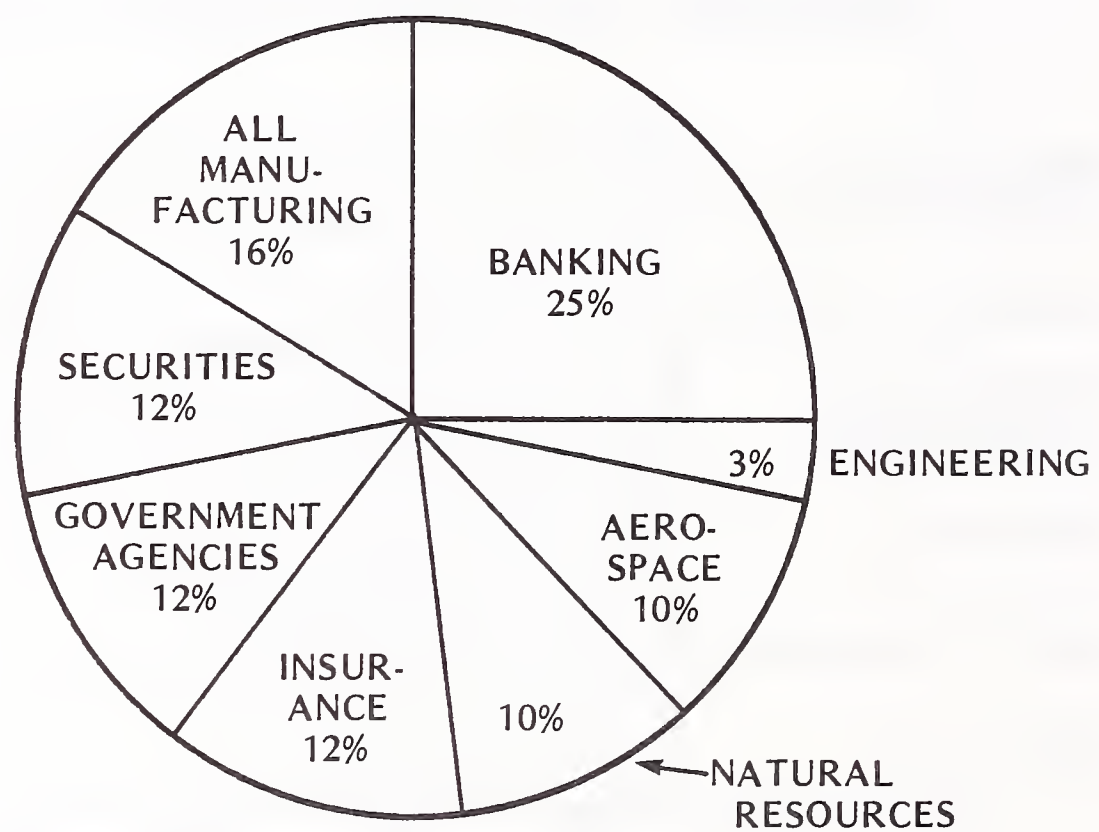
ENERGY INDUSTRY MARKETS

INPUT

MCP1 P128

INPUT

EDP EXPENDITURES IN
ENERGY INDUSTRY - 1980

MCP1 P129

INP
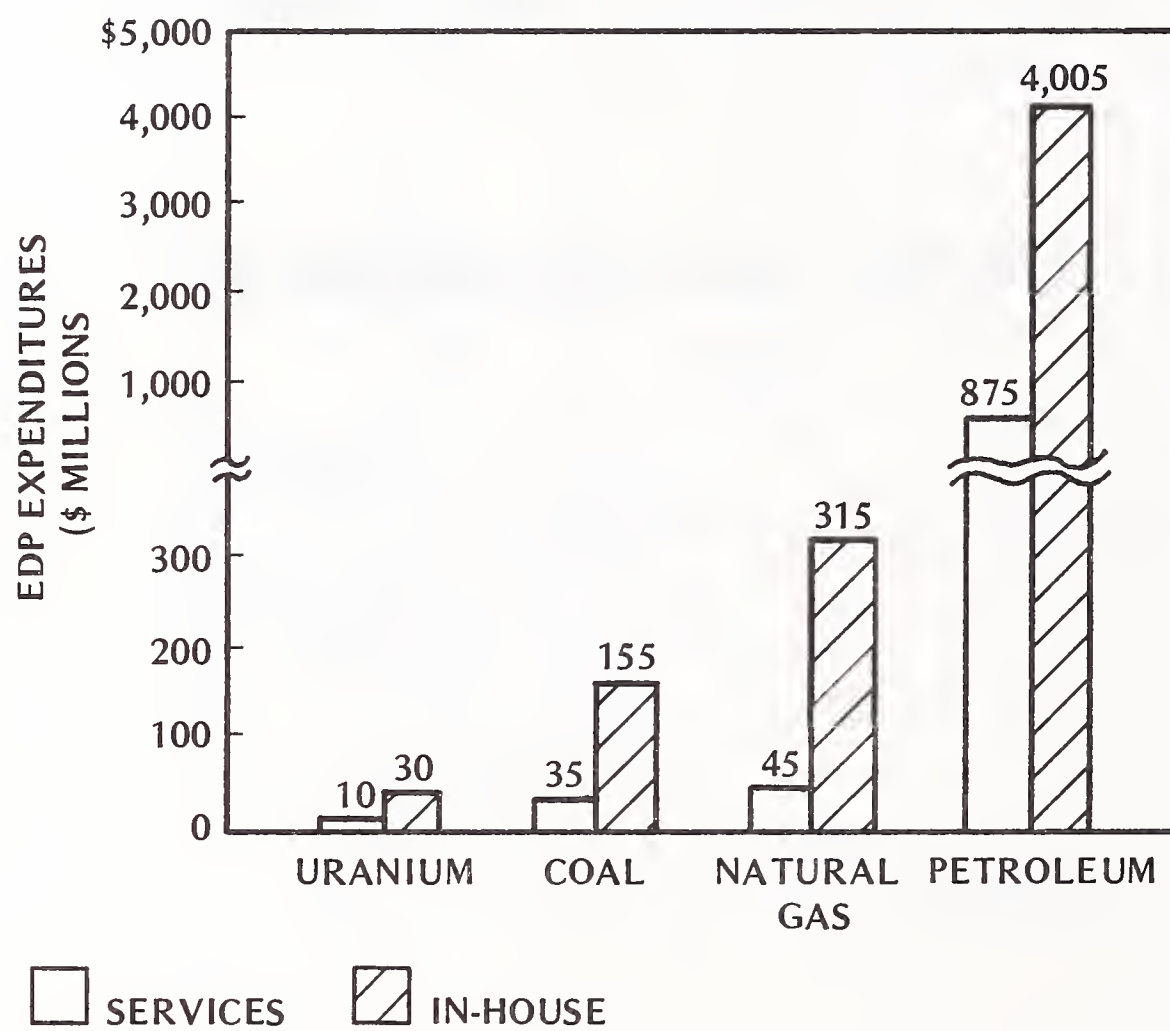
INFORMATION SERVICES MARKETS
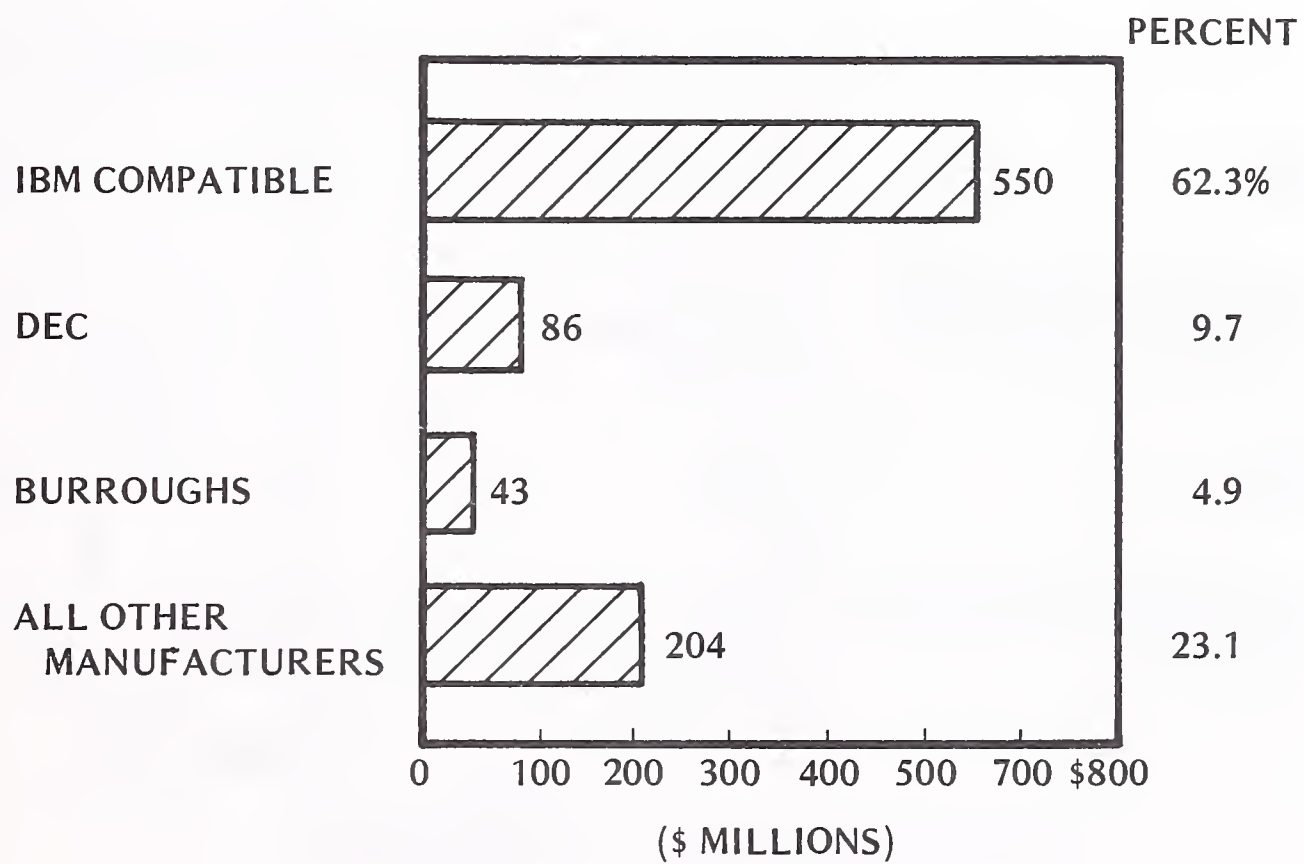# IN ENERGY INDUSTRY

MARKET SIZE
($ MILLIONS)

☐ 1980 ◿ 1985

INPUT

INPUT

APPLICATIONS SOFTWARE
PRODUCT MARKETS

MCP1P13

INF

1980 APPLICATIONS
SOFTWARE PRODUCT MARKET
- BY TYPE OF TARGET COMPUTER

PERCENT

	($ MILLIONS)	PERCENT
IBM COMPATIBLE	550	62.3%
DEC	86	9.7
BURROUGHS	43	4.9
ALL OTHER MANUFACTURERS	204	23.1

0 100 200 300 400 500 700 $800
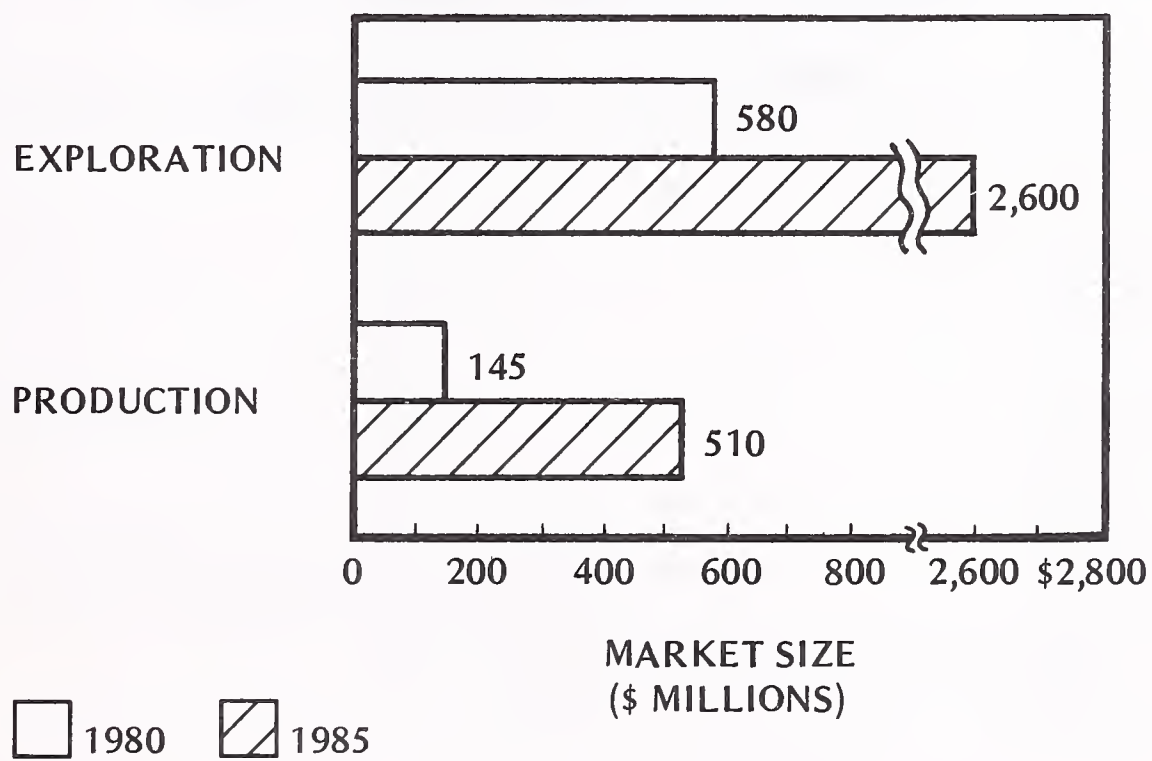
($ MILLIONS)

INPUT

1980 APPLICATIONS SOFTWARE PRODUCT MARKET
- BY MAJOR VENDOR

		PERCENT
IBM	105	11.8%
ALL OTHER COMPUTER MANUFACTURERS	104	11.8
MSA	41	4.6
ALL OTHER INDEPENDENT VENDORS	633	71.7

0   100   200   300   400   500   600 $700

($ MILLIONS)

MCP1 P133

INP
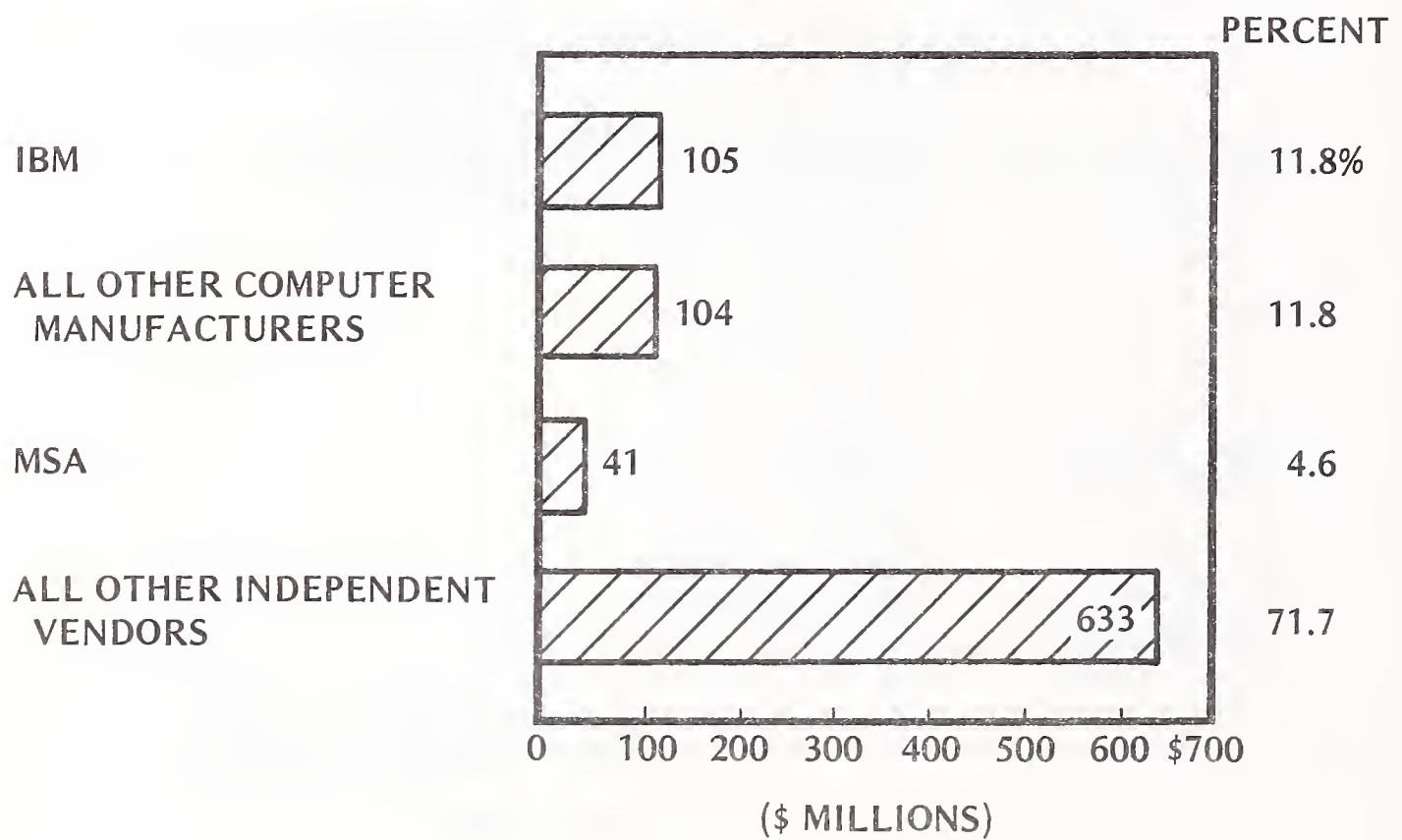
VERY SMALL COMPUTER APPLICATIONS
PRODUCTS MARKET

SYSTEM COST < $15,000

60% AAGR
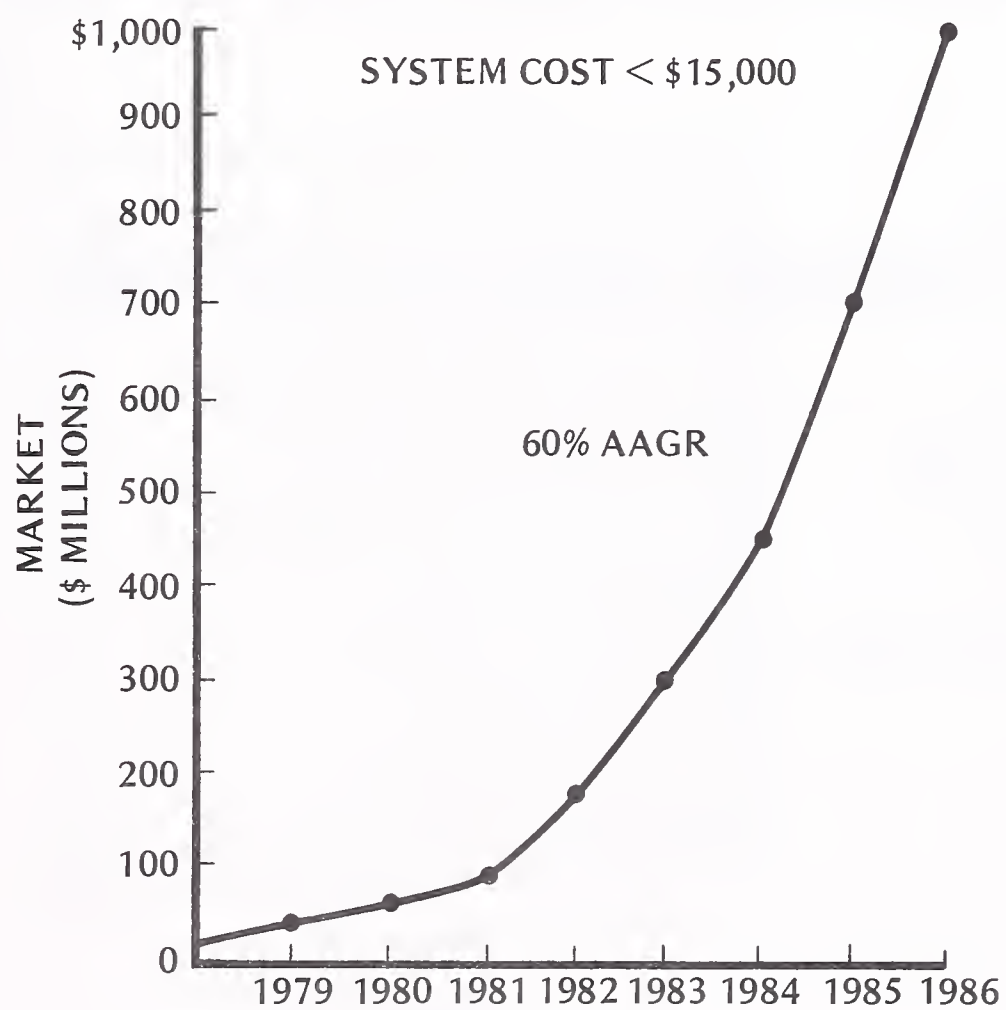
INPUT

APPLICATIONS SOFTWARE PRODUCTS MARKETS
- GROWTH BY INDUSTRY SECTOR

	1981 – 1986 INCREMENTAL GROWTH ($ MILLIONS)	GROWTH RATE (PERCENT)
DISCRETE MANUFACTURING	737	30%
WHOLESALE	550	36
BANKING AND FINANCE	505	18
PROCESS MANUFACTURING	359	35
RETAIL	336	35

0 100 200 300 400 500 600 700 $800

1981 – 1986
INCREMENTAL GROWTH
($ MILLIONS)

- 130 -

MCP1 P135

INPU

ON-LINE DATA BASE MARKETS

MCP1P136

INPUT

ON-LINE DATA BASE MARKETS

MCP1 P137
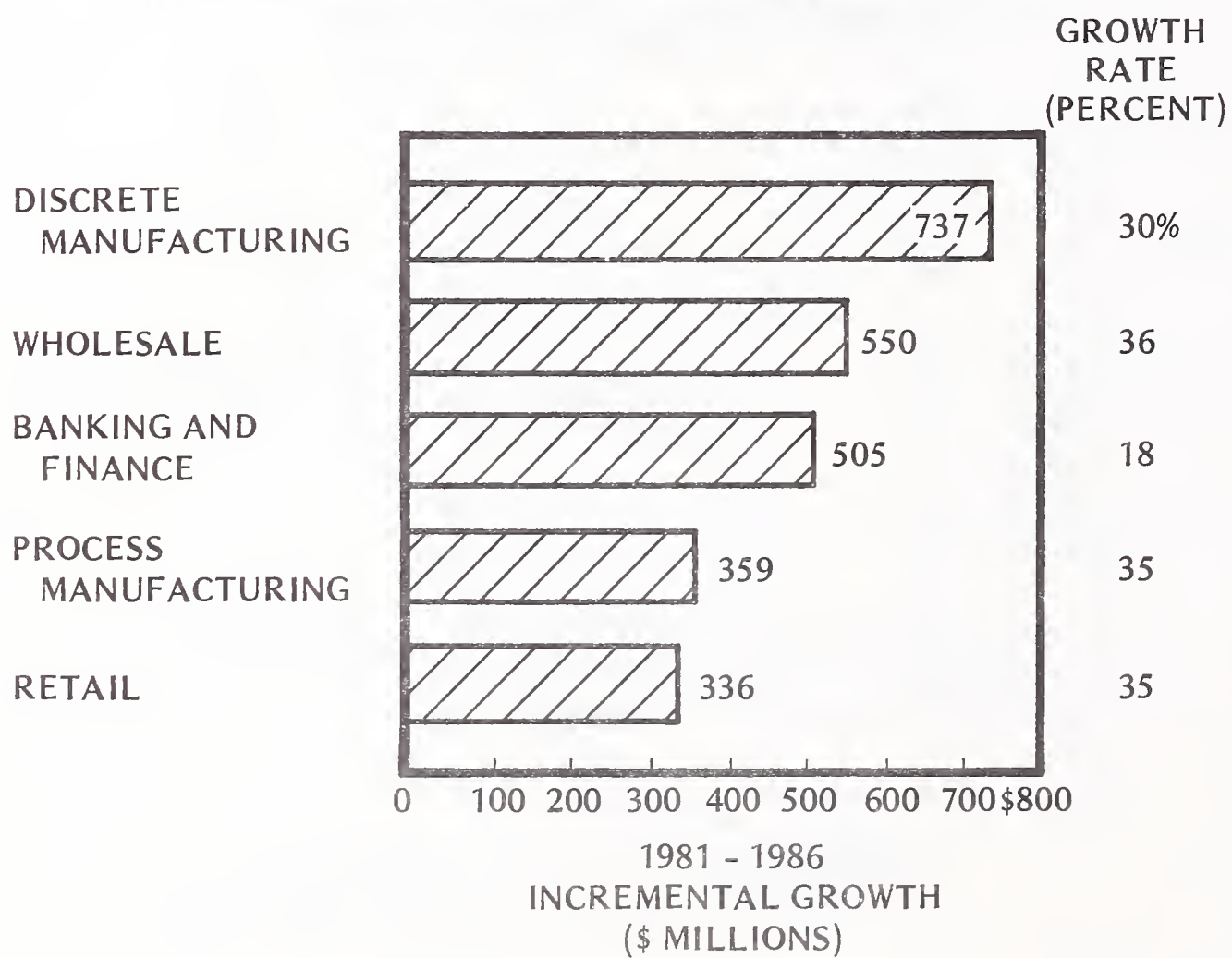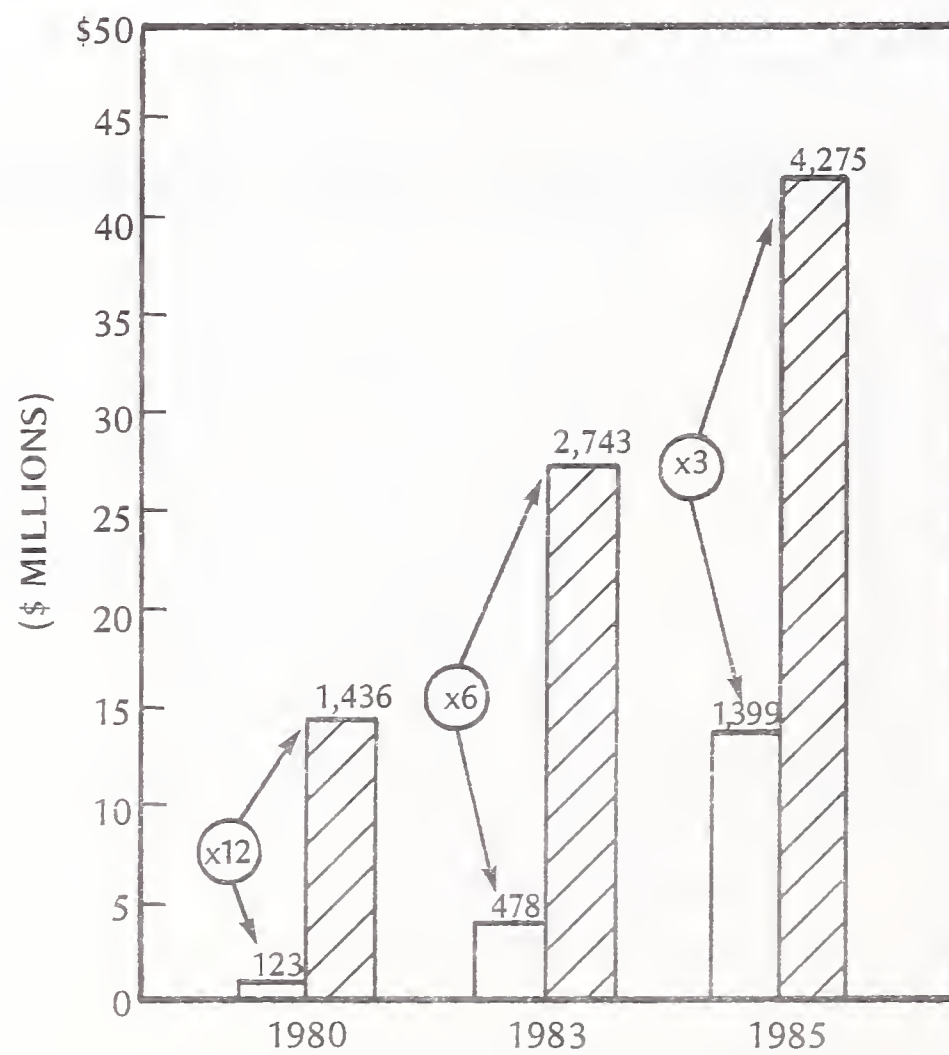
INPUT

ON-LINE DATA BASE
MARKETS - EUROPE

BIBLIOGRAPHIC
22%

INDUSTRY
SPECIFIC
16%

BUSINESS
INFORMATION
48%

MARKETING
9%

OTHERS
5%

1985 $1.4 BILLION

- 133 -

INPUT

MCP1 P138

INPUT

ON-LINE DATA BASE MARKETS

UNITED KINGDOM — 55, 400

FRANCE — 10, 300

WEST GERMANY — 5, 150

ITALY — 10, 110

REST — 40, 440

MARKET SIZE
($ MILLIONS)

MCP1 P139

INP
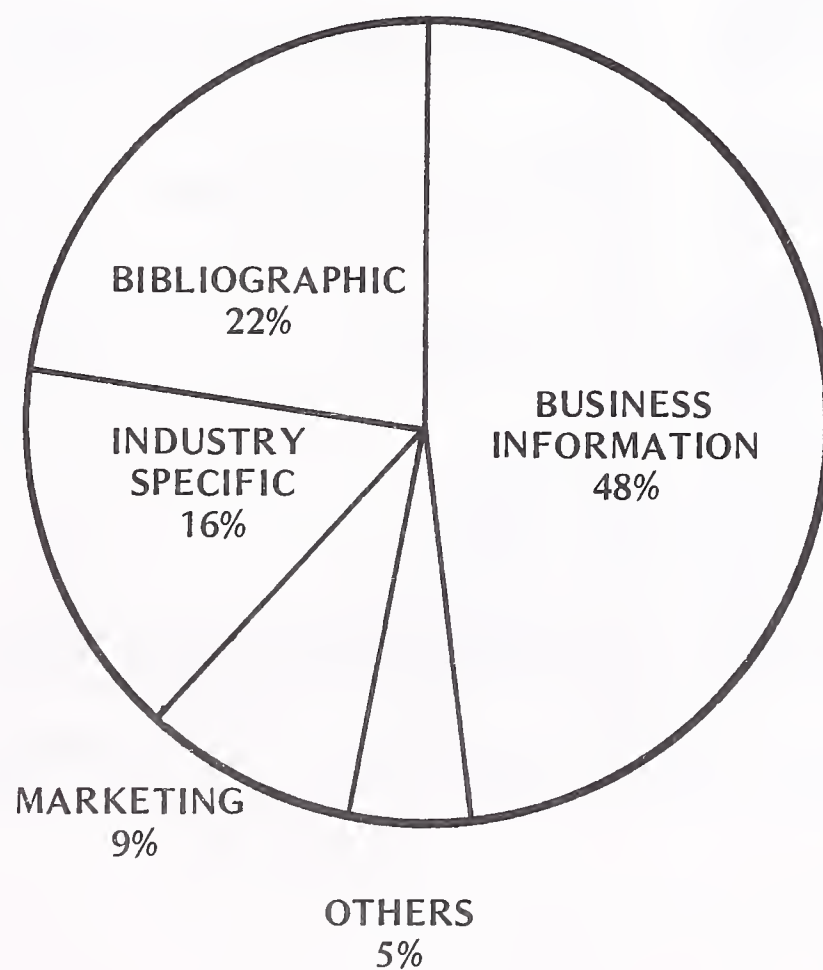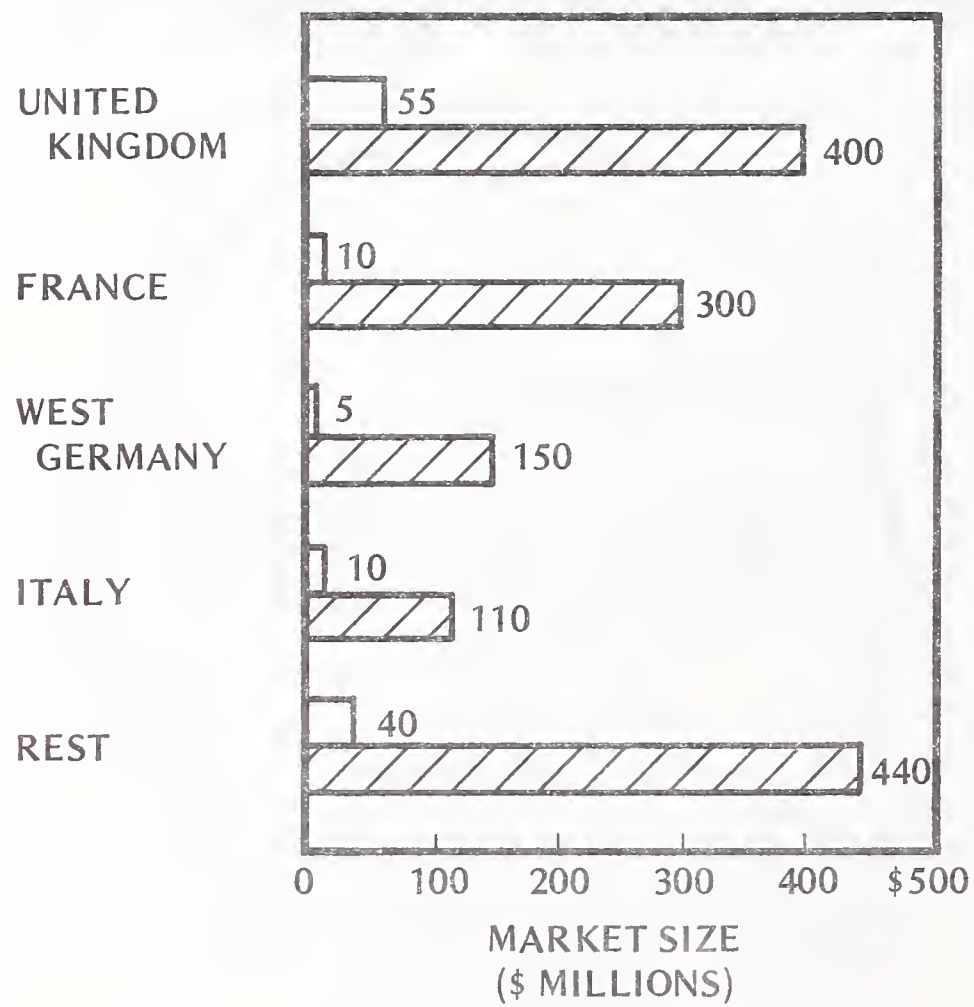
VIDEOTEX MARKET FORECASTS - EUROPE

MCP1 P140
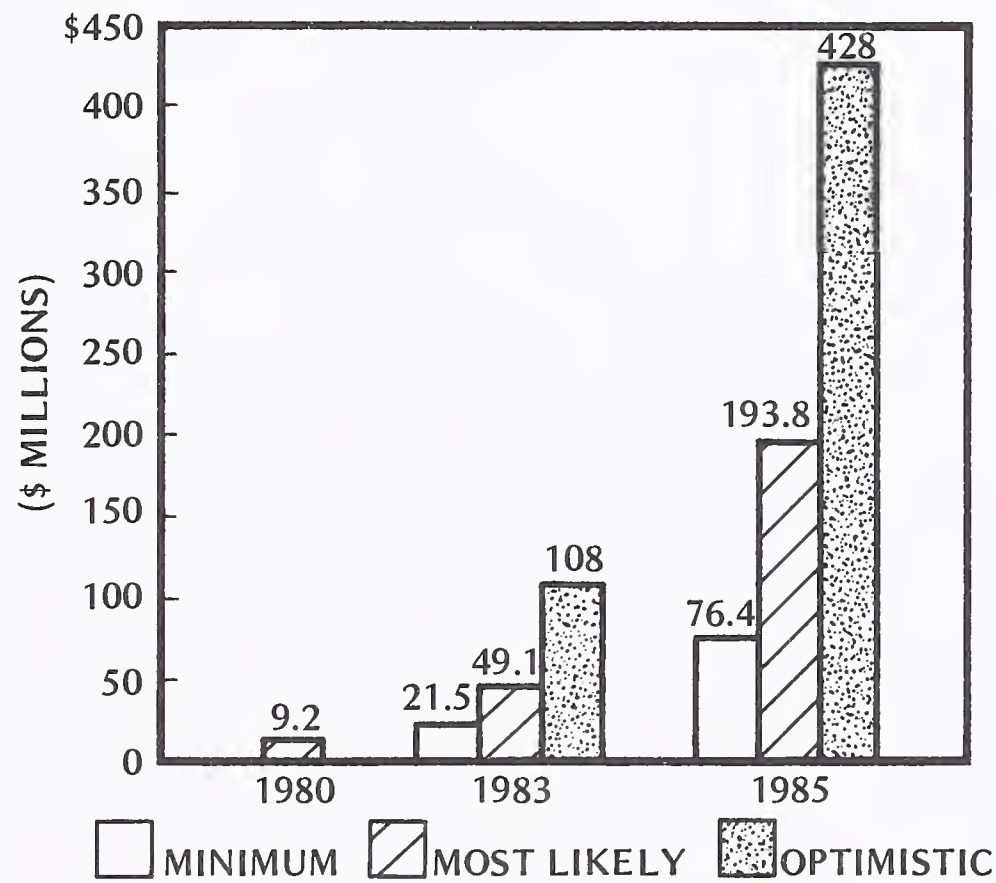
INPUT

VI. CONCLUSION

- INFORMATION SERVICES IN 1990

ENVIRONMENT

- INCREASED AUTOMATION PRESSURES

  - HIGH ENERGY COSTS

  - HIGH INTEREST/INFLATION RATES

- ASSETS CHEAPER TO ACQUIRE BY MERGER/ ACQUISITION

- CENTRALIZATION/DECENTRALIZATION CHANGE

- SOME WORK MOVEMENT TO "COTTAGE" INDUSTRY/HOME

- PERSONAL SYSTEMS WIDESPREAD

MCP1P142

INPUT

TECHNOLOGY

- WAVES OF CHEAPER AND MORE POWERFUL COMPUTERS

- INTERNAL COMPUTER SPEED 100 TIMES FASTER THAN 1981 BY 1990

- DISPERSED COMPUTER ARCHITECTURE

- "DISPOSABLE" OR "FREE" PROCESSORS

- STORAGE CHANGES MOST IMPORTANT

MCP1

INF

TECHNOLOGY

- MAJOR COMMUNICATIONS COST REDUCTIONS BY 1990

- COAX/CABLE IN MOST HOMES AND BUSINESS ESTABLISHMENTS

- AUDIO TO DIGITAL TECHNOLOGY IMPLEMENTED

- INFORMATION STORAGE AND PROCESSING CAPABILITY IN TELECOMMUNICATIONS NETWORKS

  - LIBRARIES

  - SHOPPING

  - MAGAZINES

- TELEPHONE/TELEVISION "FULL SERVICE" PRODUCTS

MCP1 P144

INPUT

SOFTWARE

- "SOFTWARE ON A CHIP"
- APPLICATIONS PROGRAMMERS OBSOLETE
- SPECIALIST APPLICATIONS BUILDERS
  - LIBRARIES OF AVAILABLE SOFTWARE
  - GENERATORS
- SPECIALIST SYSTEMS ENGINEERS

MCP1P14

INP

OVERALL ISSUES

- PEOPLE AVAILABILITY

    — 300,000 PEOPLE NOW

    — 1,000,000 BY 1990(?)

- PEOPLE SKILLS

- COMPENSATION PACKAGES

- 141 -

PROCESSING SERVICES ISSUES

- **LONG-TERM TRENDS - NEGATIVE**
  - REPLACEMENT
  - CONVERSION OF CONTRACTS
- **LONG-TERM TRENDS - POSITIVE**
  - ADDITION OF PROFESSIONAL SERVICES
  - SOFTWARE DELIVERY VEHICLE
  - SOLUTION TO COMPLEX SITUATIONS
  - DEMAND FOR APPLICABLE INFORMATION
  - FRAGMENTATION OF BUYING POINTS

MCP1 P147

INP

PROCESSING SERVICES ISSUES

- ACQUISITION
- INVOLVEMENT IN NEW AREAS
  - HARDWARE
  - SOFTWARE
  - COMMUNICATIONS
  - OFFICE
- ROLE IN EID (ELECTRONIC INFORMATION DISTRIBUTION)
- INDUSTRY/APPLICATION SPECIALIZATION

MCP1 P148

INPUT

PROCESSING SERVICES ISSUES

- REPLACEMENT/HARDWARE FACTORS
  - DEALING WITH TREND TO IN-HOUSE
  - BUSINESS EXPOSURE TO PERSONAL SYSTEMS
  - EXPOSURE/ROLE VIS-A-VIS TURNKEY
  - TYPE OF USER SITE HARDWARE SERVICE
- PRICING/UNBUNDLING
- DISTRIBUTION

- 144 -

PROCESSING SERVICES IN 1990

- PROCESSING SERVICES WILL BE
  PROVIDED BY

  - COMMUNICATIONS COMPANIES

  - BROADCAST COMPANIES

  - PUBLISHERS

  - COMPUTER MANUFACTURERS

  - BANKING/FINANCE COMPANIES

  - PROCESSING SERVICES COMPANIES

  - NON-INFORMATION INDUSTRY COMPANIES

INPUT

MCP1 P150

INPUT

PROCESSING SERVICES IN 1990

- PROCESSING WILL BE "FREE"

- INCREASED SOFTWARE, CONSULTING AND
  DATA BASE COMPONENTS

- SERVICES WILL START TO OVERCOME
  IN-HOUSE PROCESSING

- PROVIDE PROCESSING SOLUTIONS

MCP1 P15

INPU

SOFTWARE PRODUCTS ISSUES

- ON-LINE, DISTRIBUTED PROCESSING PRODUCTS

- COMPUTER MAINFRAME TARGETS

- MANUFACTURER COMPETITION

  - UNBUNDLING

  - INTRODUCING PRODUCTS

  - DISTRIBUTION VEHICLE

- "PLUG-COMPATIBLE" SOFTWARE

MCP1 P152

INPUT

SOFTWARE PRODUCTS ISSUES

- SOFTWARE SALES, DISTRIBUTION, INSTALLATION PROCESS
- SOFTWARE MARKETING
- SOFTWARE "MANUFACTURING" VERSUS "PUBLISHING"
- DEGREE OF CUSTOMIZING CAPABILITY
- SOFTWARE "ASSEMBLY" COMPETITION

MCP1P1

INPU

SOFTWARE PRODUCTS ISSUES

- GROWTH PATH
- COMMUNICATIONS NETWORK INVOLVEMENT
  - REMOTE DIAGNOSTICS
  - DOWN-LINE LOADING
  - SOFTWARE OPPORTUNITY
- HARDWARE INVOLVEMENT
  - TURNKEY
  - SERVICE

INPUT

MCP1 P154

INPUT

SOFTWARE PRODUCTS IN 1990

- VENDORS WILL BE SOFTWARE MANUFACTURERS OR PUBLISHERS

- SYSTEMS SUPPLIERS WILL PROVIDE "SOFTWARE CHIPS" - POTENTIAL LOCKOUTS

- ENGINEERING CAPABILITY WILL BE VITAL

- MAJOR SYSTEMS SUPPLIERS WILL BE SOURCES OF REVENUES FOR INDEPENDENTS

- 150 -

SOFTWARE PRODUCTS IN 1990

- PRICE CATEGORIES WILL CHANGE
- INCREASED NEED FOR OTHER REVENUE SOURCES
    - CONSULTING
    - TRAINING/EDUCATION
    - SYSTEM MAINTENANCE
    - AUTOMATED DOCUMENTATION
    - SECURITY
    - SUPPLIES
    - NETWORKS
    - DATA BASES

INPUT

MCP1P156

INPUT

PROFESSIONAL
SERVICES ISSUES

- PRODUCTIVITY
  - INTERNAL
  - EXTERNAL
- PEOPLE AVAILABILITY
- SPECIALIZATION
- SKILLS/LEARNING CURVE

MCP1 P1

INPU

PROFESSIONAL
SERVICES ISSUES

- PACKAGING

- LIBRARIES OF SOFTWARE ROUTINES

- REMOTE CONTRACTS

MCP1 P158

INPUT

PROFESSIONAL
SERVICES IN 1990

- INCREASED IMPORTANCE
- THREE TYPES OF SERVICE
  - ENGINEERING/COMPUTER ARCHITECTURE
  - APPLICATIONS SPECIALIZATION
  - MANAGEMENT
- ON-LINE SYSTEMS REDUCED DRIVER

INPUT

MCP1 P159

INPU

PROFESSIONAL
SERVICES IN 1990

- FACILITIES MANAGEMENT OPPORTUNITY
  - NOT "ON-SITE"
  - REMOTE HARDWARE
- INCREASED COMPETITION
  - SYSTEM SUPPLIERS
  - OTHER INFORMATION SERVICES COMPANIES
  - ACCOUNTANTS
  - EXTERNAL INDUSTRY SUPPLIERS

INPUT

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INPUT

CHANGE - STRUCTURAL

- DATA⟶INFORMATION

- PAPER⟶ELECTRONIC MEDIA

- OFFICE OPERATIONS

- COMMUNICATIONS

- SYSTEMS FUNCTION??

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INPUT

CHANGE = OPPORTUNITY

INFORMATION SERVICES ARE

KEYS TO OTHER MARKETS.

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INPUT